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Revolt brews among Viatel providers

By Luis Huesch

SYDNEY — Viatel service providers dissatisfied with Telecom's handling of the national videotex service are putting together a case for privatising it — as well as an industry syndicate to buy the service.

At the same time, the Australian Videotex Industry Association (Avia) is continuing strong lobbying for changes to Telecom's new Ausstream value-added network service to prevent the monopoly from keeping small videotex providers off the system through high tariffs.

Avia chairman Peter Robinson said that while Telecom had reduced its transport cost on Ausstream to $A6.80/hour when the system was launched at the end of September, the monthly minimum charge of $A950 was "clearly discriminating against small service providers".

Robinson said Avia had not been approached about efforts to privatise Viatel, but argued that if the service were ever to be offered for sale Telecom should retain the transport network. He noted that a national videotex service had been successful only in countries where the PTT operated the transport mechanism.

He criticised Ausstream for offering "levels of service the industry doesn't want — and doesn't want to pay for", and said that apart from exercising Telecom's control of the industry via the pricing mechanism, it was restricting the industry's development by not catering for newer technologies. Prestel was incompatible with packet-switching, and Ausstream would not carry Teletel-format traffic until late 1989. Support for Cept or Naplps-type videotex was even further in the future.

Industry sources said major videotex service providers, both within and without Viatel, were among those dissatisfied with Telecom's control of the system. Outside providers alleged to be critical of Viatel include Westpac and Elders. Westpac operates its own videotex service for the Handiline homebanking facility while Elders runs the Elderlink rural information service which competes with Viatel.

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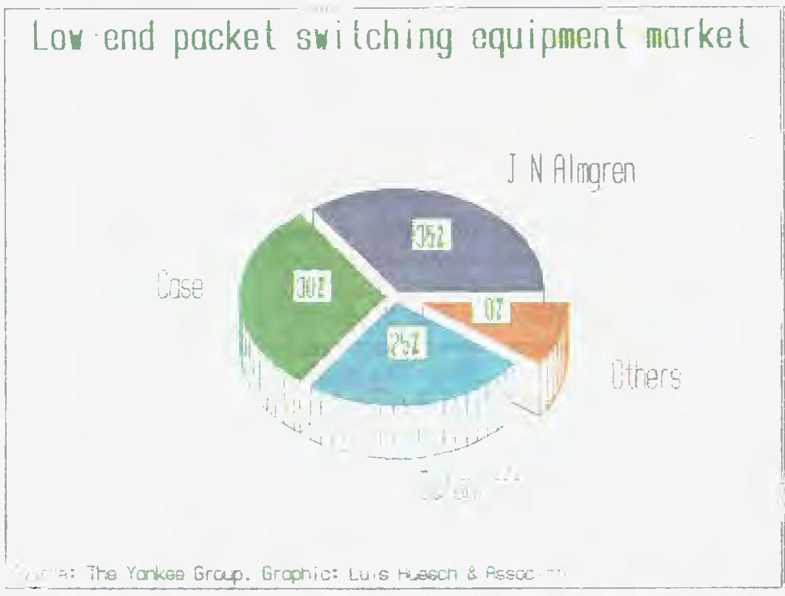
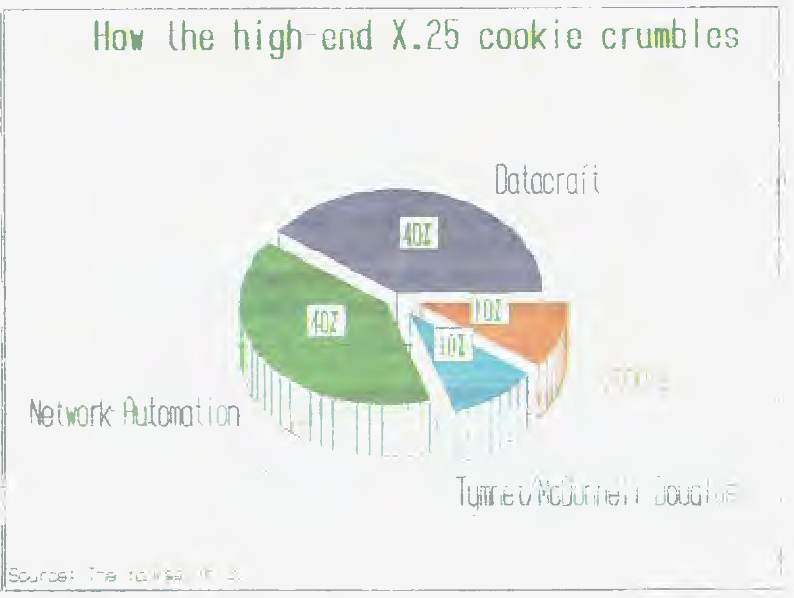

Low-end packet switching equipment market

Source: The Yankee Group. Graphic: Luis Huesch & Assoc


How the high-end X.25 cookie crumbles

Source: The [illegible]

US modem protocol wins honors

GENEVA — The MNP error-checking protocol for dialup modems has won CCITT recognition, with a study group recommending that MNP form part of a dual standard also incorporating the CCITT's own Link Access Procedure (Lap).

Standards that merge both Microcom's Networking Protocol (MNP) — promulgated by US modem maker Microcom and licensed by a number of key vendors — and a yet to be written variation on the Lap theme are not expected to be adopted before mid-1989.

In the intervening period, MNP's base of some 300,000 modems will grow faster, unchecked by concern over international connectivity following CCITT recognition of the de facto standard.

FULL STORY — PAGE 12

IBM's new Rolm PABX

RYE BROOK, New York — IBM has launched a new family of modular computer-controlled branch exchanges (CBX) developed by its Rolm subsidiary and said to be 70 per cent smaller and 70 per cent more powerful than current Rolm switches.

The new Business Communication System (BCS) line also enhances host to desktop connectivity and reduces the cost of adding switched data connections, IBM said.

Departing from the proprietary digital voice sampling technology used by Rolm to adapt to the industry standard 64K-bit/sec voice/data channel, the new switches handle from 100 to 20,000 lines.

They supersede — and are incompatible with — Rolm's mid-range and high-end CBX II switch family, and users have already voiced concern about IBM's future support, despite assurances from the vendor of "indefinite" support and continuing enhancements including ISDN connectivity if demanded by the 20,000-odd existing sites. IBM has said it will no longer market the Rolm CBX 8000 and CBX 9000 switches.

One PABX line, the 9750 BCS, is intended for users in the US, Canada, Asia, Latin America and the Middle East. A similar product, called the IBM 8750 BCS, is designed for European customers and will initially be available in the UK, France, West Germany, Austria, Belgium and Italy. It was on show at Telecom '87 in Geneva last month. IBM said future releases of the 9750 and the 8750 will provide ISDN capabilities.

The IBM 9750 is built around the IBM 9751 CBX controller, which features a modular design that allows customers to expand their systems from 100 to 20,000 lines without disrupting service. The 9751 has an enhanced systems bus that allows the switch to process 70 per cent more calls than its largest predecessor, the Rolm CBX 9000 AE.

The 9751 CBX comes in four models. A single 9751 CBX node can consist of one to five cabinets, and up to 15 nodes can be configured to create a single 20,000-line system.

IBM said it would deliver three models, Models 20, 40 and 50, from November 1. The Model 70 will be available in March 1988.

(Continued page 2)

PM launches Mark V phone

GENEVA — Prime Minister Bob Hawke was on hand to launch Australia's new generation standard telephone at Telecom '87 here last month. Called the Mark V, it was developed jointly by Alcatel Australia (formerly STC) and Telecom.

Alcatel Australia chief Bill Page-Hanify, asked by Hawke if the slimline intelligent phone was made in Australia and whether it would be exported, replied: "Too right." In fact the Mark V, now in beta testing and ready for release in mid-88, is targeted particularly at the US market. Page-Hanify said it would retail there for about $US30. Its Australian price would be "very competitive", too.

Made by Alcatel in a new Sydney manufacturing plant "designed together with the Mark V", the phone uses surface-mounted device (SMD) technology to incorporate 10-number memory, hearing aid compatibility, switch selectable pulse/tone dialling, last number redial, second number redial and other features in a 16 × 22 × 6cm package designed by Telecom that has a soft keypad and weighs a mere 555g. Part of the manufacturing will also be performed by AWA in Sydney. Page-Hanify said R&D costs for the phone and its manufacturing was around $A10 million.

Hawke, visiting the "Innovation Down Under" joint Australian stand with International

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Revolt brews among Viatel providers

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According to these sources, Telecom has revised allowable frame charges for database providers and decided to selectively exclude certain providers. It was not prepared to put these new rules in writing but informed providers individually.

A Viatel spokeswoman expressed alarm that what she described as "merely an option in our business mix" had apparently leaked from the Telecom thinktank involved. She said the "idea" was "not under serious consideration at present".

However, she agreed that the possibility of selectively excluding service providers from Viatel had been discussed, as had the issue of reducing allowable frame charges. She intimated that publishing any of the above would result in *Communications World* being penalised as far as future information from Telecom was concerned.

Telecom's alleged "censorship", in fact, is another area that grates: according to one industry source, Telecom has refused to permit advertisements for videotex services in telephone directories, while placing big Viatel ads itself. Another claimed certain newspapers were favored with "contra" ads for operating a service on Viatel. According to this source, "Viatel rides on other promotions".

Elders videotex general manager Jeremy Cape said his company certainly was dissatisfied with the way Telecom used its position as carrier and regulator while being a competitor. It was not promoting gateway access, and had made it "extremely expensive" for external service providers to compete.

Elders had made numerous representations through the Australian Videotex Industry Association (Avia). It had not sought, or been approached by people seeking to form a syndicate as it understood Viatel was not on the list of potential privatisation targets.

However, Elders "would have a look at (such proposals) in the normal course of events", depending on who was making the proposal, Cape said.

Westpac's videotex manager was unavailable for comment at press time, but sources said the fact that the bank had opted for its own service rather than use Viatel as had the Commonwealth Bank was an indication of how dissatisfied it was with the public offering.

Graham Mophett, operator of the Goldlink videotex service operating from the Gold Coast, also asserted that there are "things happening on Viatel that shouldn't be allowed". He said he was "disturbed by Telecom's handling of the database". He declined to specify details.

Mophett claimed Viatel's viability was limited as long as the service was operated by a government agency. Its management was "doing a good job", but it was "only doing what you'd expect any government department to do".

The best way to resolve the situation was for the industry participants to buy Viatel. With the government "making noises about privatisation", the time had come for the industry to act.

Mophett said moves were afoot to bring together a syndicate of interested parties. He declined to name any at this stage, but insisted there was no shortage of potential investors.

KDD sets entry prices

TOKYO — Japanese telecommunications carrier Kokusai Denshin Denwa Co (KDD) has set its entry prices for aspiring overseas value-added network service providers.

Announcing the initial payment conditions for licensing lines for international Van services, KDD said it will charge a $US24,000 startup fee for the basic contract, which will be for three to five years, depending on the customer's requirements.

In addition, KDD will offer two types of monthly licensing fees: $US6600 for data transmission speeds of 9.6K-bit/sec, and $US11,700 for 56K-bit/sec and 64K-bit/sec services. This is about 17 per cent more than private line charges.

Because KDD has a monopoly on international telecommunications, intending users must at present use the carrier's lines for their Van services.

IBM launches new modular ISDN-ready Rolm PABXs

(Continued from page 1)

The 9751 CBX is based on the Rolm 9000 AE processor, which Rolm introduced as the heart of its largest CBX earlier this year. Most other major switch components are new, however, including an enhanced version of the Rolmbus 295, operating system software and the Rolmlink line interface cards.

According to Ian Angus, president of the Canadian telecommunications research firm Angus Telemanagement Group, the IBM switch uses the traditional Rolm PABX architecture, but "every single part of the box is different from that of the CBX".

Robert Lundy, Rolm product manager for the 9751, said the new switch is not compatible with the CBX 8000 and the CBX 9000.

> *"New switch features announced with the 9751 can also serve as enhancements for current CBXs"*

Bob Wallace, senior editor with the IDG weekly *Network World,* comments that with the new switch, IBM has forsaken Rolm's proprietary 12-bit digital voice sampling technique for the industry standard 8-bit sampling method. Its implementation of the enhanced version of Rolmbus 295, will make it easier for the 9751 to operate in ISDN environments.

The old sampling scheme created a 96K-bit/sec digital voice channel, whereas the new method creates a 64K-bit/sec channel, one of the fundamental building blocks of digital transmission services and future ISDN environments.

On the station side the switch supports Rolmlink and all existing Rolm station equipment. Rolmlink is a proprietary, 256K-bit/sec digital protocol used to support the Rolmphone line of digital telephone sets, the Cypress Communications Terminal and the Juniper II, which integrates Rolm station sets with IBM Personal Computers.

IBM said standard 2500 analogue telephone sets are also supported, and the switch can use existing CBX wiring.

Customers can expand a single-node 9751 CBX from 100 lines to 2000 lines by adding interface cards and cabinets. The system is nonblocking for 928 simultaneous calls per node.

Each of the four 9751 CBX models use the newly announced RLI line interface cards, which support 16 voice and 16 data lines.

The Model 20, a one- or two-cabinet switch, supports 100 to 720 voice and data lines. The Model 40 is a single-node system that can handle as many as 2000 voice and data lines. The Model 50 has all the same features as the Model 40 but is also fully redundant. The Model 70 is a fully redundant, multinode system, capable of supporting a maximum of 20,000 lines, of which 13,920 would be nonblocked.

The 9751 CBX supports asynchronous data switching at speeds up to 19.2K-bit/sec, and synchronous data switching at speeds up to 64K-bit/sec.

The switch also has an enhanced communications processor, an onboard unit designed to off-load functions like data call set-up from the main processor. Also new is a standalone Asynchronous Rackmount

(Continued page 26)

Dialcom rolls out X.400 messaging

ROCKVILLE, Maryland — Dialcom has announced the commercial availability of its X.400 electronic message handling and interchange services for public and in-house systems in the US.

Dialcom — which provides the software for OTC's portion of the Keylink e-mail system — also announced that a fourth and fifth organisation have bought the X.400 message handling software, Dialcom400.

The newcomers are West Germany's PTT — the Deutsche Bundespost — and KDM of Japan. The X.400 software, based on CCITT standards, enables communications between dissimilar message systems.

Dialcom's X.400 message handling service is part of the company's new Pathfinder Electronic Message Handling and Message Interchange Service. The new services include interconnects to private e-mail systems and message interchange among Dialcom's 17-country, 260,000 user worldwide network.

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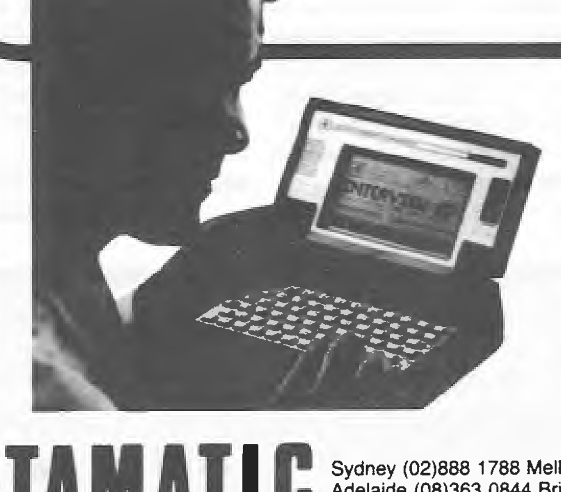

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Travel agents pioneer Transnet using ENS reservations system

MELBOURNE — Some two hundred travel agents will be among the first commercial users of Telecom's new Transnet network, due to be officially cut over late in October.

The agents, who signed up with National Reservations Systems in an ambitious scheme to tie together 2000 travel agents with airlines and related service providers, are travelling on Transnet courtesy of Electronic Network Services (ENS), the ANZ Bank's EFT/POS carrier.

ENS uses Transnet, the Telecom financial transactions network built on Honeywell Bull equipment (*Communications World*, February) and expected to eventually accommodate up to 100,000 terminals.

Telecom sources said ENS, the first major Tran$end user, had worked with Telecom from the outset, trialling and testing the system.

Telecom was operating Tran$end as a wholesale service, providing the Transnet network capacity to large customers who would then re-sell capacity to their clients.

ENS client National Reservations Systems recently bought 1000 IBM PS/2 micros in a $A7.5 million Computerland deal to lease to travel agents and service providers on its new online reservation system for a nominal sum. Travel agents who already own microcomputers will be given access to the system free of charge in what is seen as an inducement to agents now using the three airlines' separate Tias reservation system.

NRS managing director Allen Dewhurst said the system was expected to be operational by the end of the year. NRS had signed up 200 travel agents and 60 service providers.

Dewhurst said 20-25 per cent of Australia's 3000 travel agents had computerised their operations, compared to 95 per cent in the US.

Telecom readies for Transnet terminals

MELBOURNE — Telecom has announced the ground rules for connection of EFT/POS terminals to its Transnet financial transactions network.

Any terminal used in connection with the Tran$end service (Transnet is the underlying network, Tran$end the name for Telecom's service), must be tested for electrical safety and "basic network non-interference aspects" before authorisation to connect is issued.

Terminal equipment suppliers may optionally use Telecom's "Captive Node" in Melbourne to have Transnet compatibility and interworking carried out at extra cost. Normal safety testing costs $A600 for each type of device. Authorisation to connect is valid for 12 months and subject to annual renewal.

Data general, NTT in net program

WASHINGTON — Seeking to make its superminis an integral part of the next generation of private corporate networks, Data General has forged a strategic alliance with Japan's giant Nippon Telegraph & Telephone (NTT) for a longterm joint development program.

DG and NTT agreed to jointly develop the first network system to integrate packet- and circuit-switching that would allow corporate users to more efficiently use the capacity of their wide-area digital networks.

Officials provided only sketchy details about the product development program, code-named Asparagus, but said the so-called "hybrid exchange system" will be customer premises equipment. DG's Eclipse MV family of superminicomputers will be embedded in the system and linked to communications processors that perform the switching functions.

The companies said digitising technology will be employed so that voice, data and images can be integrated on the same megabit/sec lines.

PM launches Mark V phone

(Continued from page 1)

Telecommunications Union secretary-general R E Butler, also heard Telecom managing director Mel Ward announce an agreement with QPSX Communications Pty Ltd of Perth to establish a $A5 milion pilot digital network based on QSPX's fast packet-switching technology.

Ward said the multimegabit service with dedicated synchronous links of up to 140M-bit/sec could be the forerunner of a generation of new high-capacity user networks. QSPX is a joint venture between Telecom and the University of Western Australia.

The ITU exhibition and conference showcases the latest in communications technology, highlighting in particular ISDN applications, at the Palais des Expositions at Geneva.

Some 900 exhibitors have put up elaborate displays, many making new product announcements for the benefit of some 50,000 high-calibre delegates and visitors to the one-week event. *Communications World* will provide full coverage of this most important four-yearly event in the next issue.

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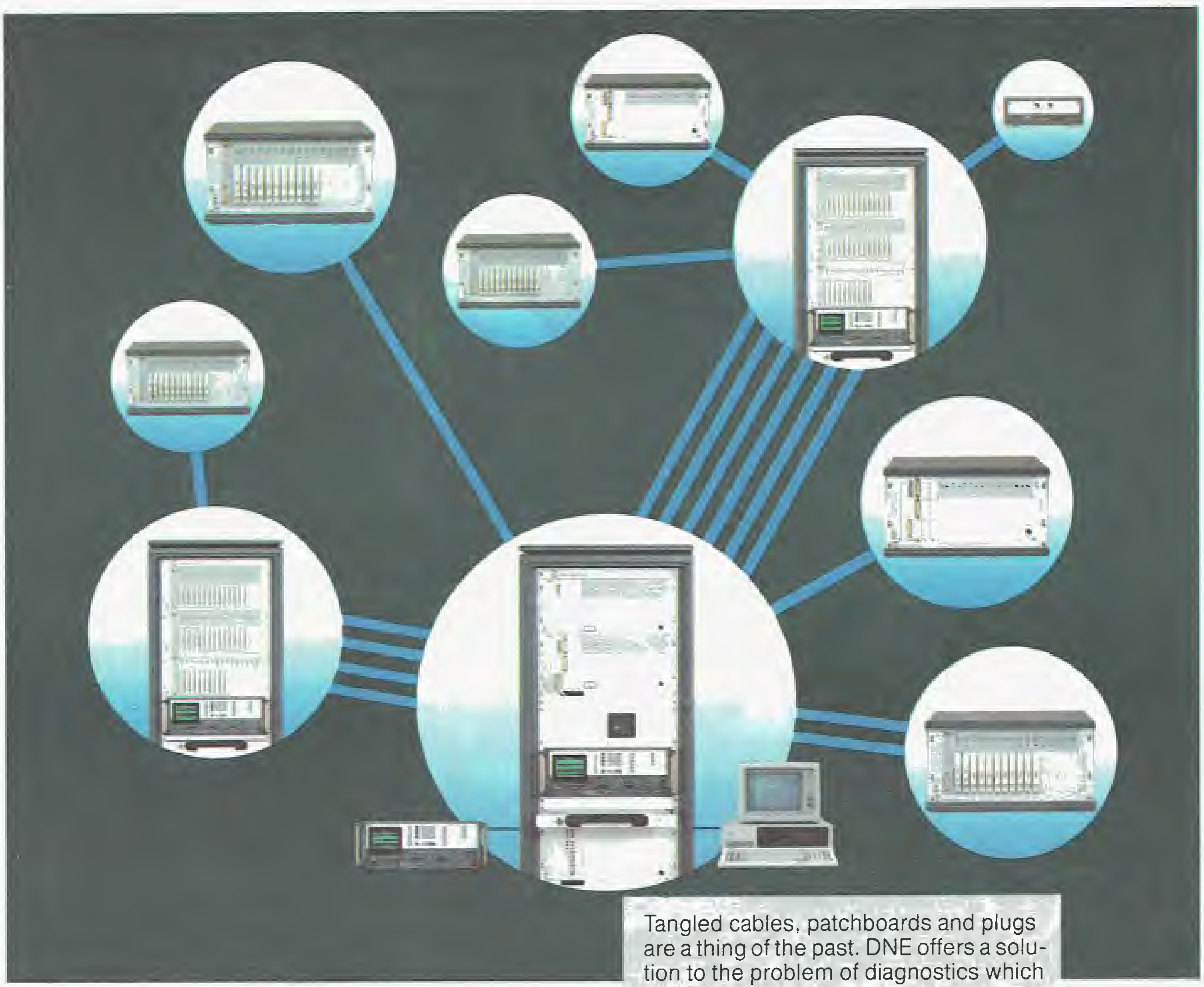

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Faxstream dammed for the duration

By Luis Huesch

MELBOURNE — Telecom is reconsidering its options on the new Faxstream closed-user group high-quality facsimile transmission service following underwhelming customer response to the offering.

According to the commission, a "total review" is being made of the service, introduced only at the end of July. A spokesman said customers were "not enthusiastic" about the closed-user group (Cug) concept, which was intended to give large corporate users full digital pathways for fax exchanges among members of the Cug.

According to the spokesman, customer applications to join the specially-priced service were "below targets and expectations". Those now on the service were enjoying discounted tariffs of a flat usage fee of $A160 a month.

> ‘Customer applications to join were below targets and expectations’

Seeing that customers do not want to be cut off from the 60,000-odd fax machines out in the open on the Public Switched Telephone Network (PSTN), Telecom engineers are now looking at the possibility of providing gateways between the PSTN and the Integrated Digital Network (IDN) users for Faxstream. "The engineering implications are not quite clear at the moment," according to the spokesman.

The spokesman said that it was found most prospective Faxstream customers would like the benefits of full-speed (9.6k-bit/sec) error-free fax transmission promised by Faxstream but also wanted to have access to, and be accessible from, the PSTN.

Only two unspecified corporate clients had so far opted for retaining the closed-user group scheme, and Telecom might provide a special service for such clients if and when the service was restructured, the spokesman said.

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Making the (ab)user pay

MELBOURNE — Telecom has confirmed it will charge for directory inquiries from July next year (*Communications World,* October), saying it will bill three meter pulses for calls to 013 asking for numbers already listed in local directories.

The charge — 60¢ at current tariffs — will be waived for certain callers such as the visually impaired, and businesses employing such people could expect "special consideration", according to a Telecom announcement.

Managing director Mel Ward said "work is continuing on determining the most appropriate method of identifying people who should have 'free access' " flagging placed on their service.

"Ward said two out of three calls to the 013 service were for numbers already listed in the caller's local directory. The service cost Telecom around $57 million to provide last year, and without the billing-back might have doubled to $100 million a year by 1988/89, he said. These costs were now subsidised indirectly by all users.

OTC orders satellite equipment

SYDNEY — The Overseas Telecommunications Commission (OTC) has ordered $A3.5 million worth of small dish satellite data communications equipment from Equatorial Satellite Systems Australia.

The Equatorial connection is intended to bolster OTC's bid to make Australia a regional hub for business in the South Pacific and South-East Asian areas through its Satnet international Vsat offering. These ambitions are strongly rivalled by both Singapore and Hong Kong.

Under the contract, Vsat master stations will be set up at OTC's Sydney and Ceduna earth stations, and a system control centre installed at the commission's Broadway, Sydney, communications gateway.

Tieline links

Telecom tielines would link a customer's mainframe in Australia to the master stations for communicating with micro earth stations at customer sites in the two regions via Intelsat's Pacific and Indian Ocean satellites.

The commission plans phased introduction of the star-configuration Satnet service "in response to demand", with X.25 packet-switching support and SNA protocol support promised for the end of this year.

OTC said business response to a number of customer trials "has been tremendous" since the service was announced last year. Many organisations were interested in Satnet for applications such as travel bookings, remote automatic teller machines, and access to remote mining and exploration sites. But database access, electronic mail, facsimile transmission and office automation functions are equally suitable applications.

Satnet is intended to support low-volume periodic interactive transactions. OTC describes Satnet as having all the advantages of private line service without the cost penalty for a full private line.

France frees Van market

PARIS — IBM has entered the French value-added network service within weeks of France taking the first official step toward dismantling its PTT monopoly.

A series of decrees intended to set the stage for further parliamentary debate on deregulation initially allows private companies to offer Van services on the network of the state-owned carrier.

IBM holds 49 per cent of the new Van company, called Axone, in a joint venture with three banks and software house Sema-Matra 5 per cent minority shareholder.

According to an IBM spokesperson, Axone will eventually offer services to the insurance and automobile industries. But initially, it will sell backup remote processing services previously offered by IBM in France through the company's International Network Services unit. The network, which is immediately operational, is based on IBM's proprietary SNA protocols but will offer access to OSI protocols "as they are available.

The French PPT has accepted arguments against imposing rates based on volume announced plans, which IBM and others said would hurt the economic viability of any such services.

Instead, it preserved fixed rates on lines Van operators will lease from the carrier. On the other hand, the state monopoly has stipulated that Van providers may not pass on more than 15 per cent of carrier costs to their users. This effectively requires the bulk of the bill to be for value-added service, something that will make it expensive for less well-heeled startups to enter the market.

As in Australia, European governments are facing strong lobbying from unions worried about job loss in a liberalised, competitive environment, as well as from PTTs fearing encroachment on their common-carrier turf. France had therefore been expected to impose usage-based rates to regulate the growth of the emerging Van market.

Further decrees promised by PTT minister Gerard Longuet for liberalising cellular telephone and public pay telephone services are not expected to be debated in this election year.

Overseas Outlook

Mitsubshi to build PABXs

TOKYO — Mitsubishi Electric Corp is developing its own mid-range digital PABXs to cater for the upswing in domestic demand following privatisation of Nippon Telegraph and Telephone Corp (NTT) in 1985. Mitsubishi first entered the market through joint marketing of IBM subsidiary Rolm Corp's highend PABXs.

Mitsubishi said it will continue marketing Rolm's high-capacity products, offering its own mid-range PBXs at the same time. Toshiba Corp, which has an arrangement with AT&T for marketing mid-range switches, also plans to make its own high-capacity PABXs. Mitsubishi's PABXs are expected to be available next summer.

BT makes $60m switch R&D bid

KANATA, Ontario — British Telecommunications Plc has pledged up to $60 million over the next three years to support an extensive research and development effort for Mitel's SX-2000 highend digital PABXs. In return for its investment, Mitel's parent company will receive a royalty based on SX-2000 sales resulting from these new developments.The R&D program will be carried out at Mitel's corporate headquarters here.

British Telecom's infusion of capital for SX-2000 is part of a program to revamp the switch maker's entire PABX line.

Bundespost ends AT&T monopoly

FRANKFURT, — The West German PTT has agreed to let competing US carriers connect directly to the Bundespost public switched telephone network, without passing through AT&T exchanges. The facility will operate from January 1 next year.

Until now, the Bundespost has negotiated access to its exchanges with AT&T only. As part of the six-month trial, Sprint — the joint venture between GTE and United Telecommunications — as well as MCI International have signed agreements with the Bundespost for long-distance telephone services. During the trial, MCI and Sprint customers will be able to dial direct to Germany.

Mitel cuts price and may sell direct

SAN DIEGO — Mitel has slashed the prices of its lowend and mid-range PABXs by an average of 20 per cent in an effort to stave off competitors in the under-500-line switch market. The cost cuts, announced at the Tele-Communications Association's 25th Annual Conference and Exhibition here, were prompted, at least in part, by declining sales of the company's smaller analogue and digital switches, according to the company. The price reductions apply to unspecified "entry-level" configurations of Mitel's SX-20, SX-50 and SX-200 analogue and digital switches.

Mitel's highend PABXs, the SX-2000S and the SX-2000SG, are reportedly not affected. Mitel has long dominated the US under-100-line switch market, selling mostly through dealers and supply houses. The company is now considering direct sales to users.

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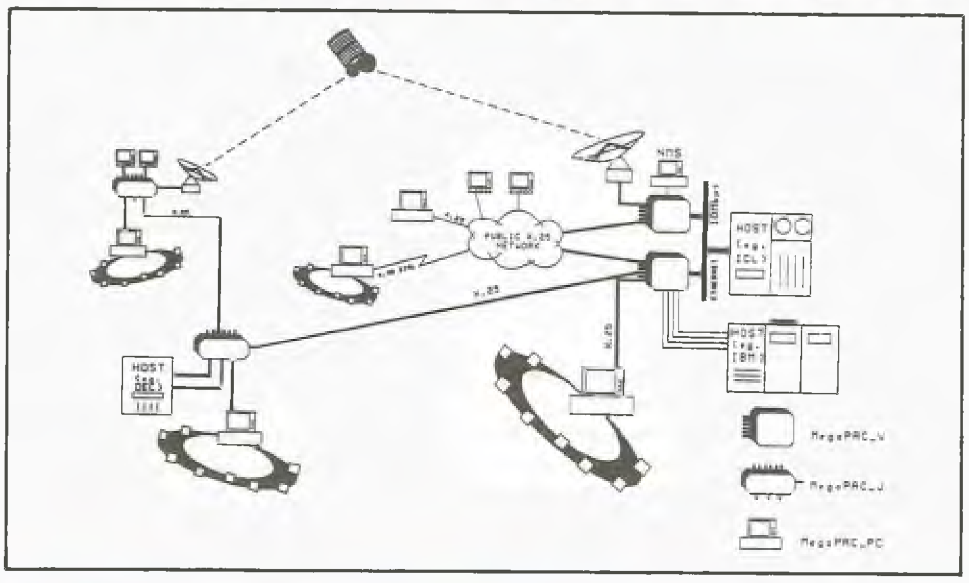
Integrated product range helps packet-switching choice



By Luis Huesch

SYDNEY — Packet-switching is still very much the flavor of the month, and new-products are being introduced all the time to tempt the X.25 network builder.

His or her task becomes easier if there is an integrated product range to choose from.

Sydney-based JN Almgren's new Megapac suite of X.25 components is such an offering — and it includes a "functionally rich" PC board that goes a long way toward addressing the PC-Lan-SNA connectivity need. (What it means is: you can put off buying that 9370 — perhaps forever!)

A mix of French, Canadian and locally made ingredients go into the high-throughput (several thousand packets a second with cascaded nodes) Megapac menu, tied together with integrated network management capable of being run from personal computer.

According to JNA managing director John Almgren, the products "provide customers with perhaps the most integrated solution to data communications needs available in Australia. It brings together users and resources on PC Lans remote PCs, terminals, minicomputers and large-scale hosts. The facilities of public and private networks may be drawn upon at will".

The Megapac range consists of PC interface board called the Megapac-PC, the locally designed Megapac-J medium-capacity switching packet assembler/disassembler, a high-capacity switch designated the Megapac-V and the Megapac-NMS network management system.

> *‘The major benefits of this approach are that a user can access SNA and asynchronous hosts from the same workstation simultaneously’*

The French-built Megapac-V uses the VME bus and is based on the Motorola MC68000 processor. It has a measured throughput of 580 two-way packets/sec. An inbuilt 10M-bit/sec Ethernet interface lets users cascade Megapac-V units on local area networks to build up virtual large-capacity nodes that may be distributed over several kilometres and is claimed to switch "several thousand packets a second" in this way.

According to JNA marketing/systems engineering manager Kevin Bloch, the unit embodies comprehensive network address translation and conversion facilities in its switching and routing operations, "enabling Megapac-V to overcome the problems related to interconnecting public and private networks."

Builtin network management facilities let users configure and control the unit either locally or from a remote console. Reports, statistics and billing records can be created.

"Megapac's ability to transparently pass unique or unusual protocols within X.25 avoids the cost of 'splinter' networks to handle a limited traffic volume, said Bloch. "For example customers with Codex statistical multiplexers can integrate their equipment into the Megapac network, thereby retaining their investment."

The JNA-developed Megapac-J Pad also uses an MC68000 to manage its two-to-22 ports, which can be dynamically configured for either X.25 or asynchronous operation. To be available early next year, the Pad is said to fully integrate with the proven Megapac-V Pad. It, too, can be remotely controlled. An LCD display provides for local configuration and status reporting.

Recognising the ever-widening niche created by the need for personal computers

(Continued page 22)

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HP fires salvo of network products

By Elisabeth Horwitt

CUPERTINO, California — Hewlett-Packard has fired a salvo of networking products said to let users partition applications across multiple HP minicomputers and to integrate IBM and DEC computers into the network.

Key among the introductions are software offerings that allow HP microcomputers and IBM PCs to transfer files or access applications on HP and DEC minicomputers distributed across an HP Advancenet or a Decnet network.

HP also announced support for IBM's Netbios and future support of IBM's Token-Ring network as well as the PU2.1 peer-to-peer protocol. It further announced two communications software packages designed to enhance communications between IBM PCs and HP 3000 minicomputers. Network Interprocess Communications/Remote Process Management software allows users to run part of an application on an HP 3000 and part on either a PC or an HP Vectra personal computer, the vendor claimed.

The applications must be written "so that part uses MS-Dos, and part can access HP 3000 data bases," HP said. The software provides direct communication between the applications so that the user need not initiate contact with the minicomputer, according to Bernard Guidon, marketing manager of networking at HP.

Network File Transfer allows a PC application to transmit to a remote HP 3000 across HP Advancenet and across a gateway to a DEC Vax on Decnet, Guidon said. The gateway, an existing product, translates routing commands from one network environment to the other, he added. The software allows "not just file transfer but interactive sessions" to take place across a hybrid networking environment, Guidon said.

Both programs are offered at no extra cost as part of the Officeshare family of HP 3000-based OA applications with communications software that allows PCs to access the services and other resources on an HP minicomputer. The enhancements will be available in the first half of 1988.

The enhancements to Officeshare represent "a very significant advance for HP, allowing users and application developers to take advantage of a distributed network," said David Terrie, president of Newport Consulting.

The software "puts HP's handling of distributed applications on a par with what DEC does now, although HP does not have a cluster configuration or a naming system," he said.

According to Terrie, IBM now offers some distributed computing products "in several pieces", including Distributed Data Management and Systems Network Architecture Distributed Services (Snads).

In the near future, HP should announce a naming system giving users transparent access to resources distributed across networked nodes, Terrie said, adding that "DEC has something close to a naming system with

(Continued page 20)

Japan jumps on Van wagon

TOKYO — Japan is to negotiate with the Dutch to develop international value-added network (Van) services, following similar talks with the UK. The Japanese Ministry of Posts and Telecommunications (MPT) has been accelerating its Van service efforts with European nations in an effort to link the Tokyo, New York and London stock exchanges.

Ericsson wins Chinese order

STOCKHOLM — LM Ericsson has received $US50-plus million worth of orders for AXE digital switches and support systems from China. The switches, to be manufactured in Sweden, will be delivered over a three-year period beginning next year. The orders are in four parts: a 12,000-line tandem switch for Guangzhou, a 12,800-line tandem switch for Shanghai, a 6000-line tandem switch for Shenyang and a two-year agreement to supply 100,000 lines for the Guangdong province.

NEC claims first for ISDN chips

TOKYO — NEC Corp has developed three large-scale integrated circuit (LSI) chips claimed to be the first of their kind for use in Integrated Services Digital Networks (ISDNs). The chips are the uPD98001 for time-sharing bidirectional transmissions; the uPD72107 for packet communication control based on Lap-B; and the uPD72305 for protocol processing based on Lap-D. NEC plans to start volume production in January, while sampling is scheduled to start this month.

Alcatel dips toe in Russian waters

PARIS — Alcatel NV, the French-controlled telecommunications giant based in the Netherlands, looked East and West recently to sign two major contracts. Submarcom, a subsidiary of Alcatel's Cables de Lyon and Alcatel-CIT, revealed that it had signed a contract with the USSR worth $US36 million to supply an underwater telecommunications link. Separately, Xtra Business Systems, an Alcatel unit, said it signed a contract for about $US32 million to supply US-based C3, Inc with the Xtra/286 AT-compatible microcomputer.

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Adding more users doesn't mean you should add more high cost ports.

Ports are expensive – up to $1000 per port for async systems, and as terminal numbers grow, response times suffer.

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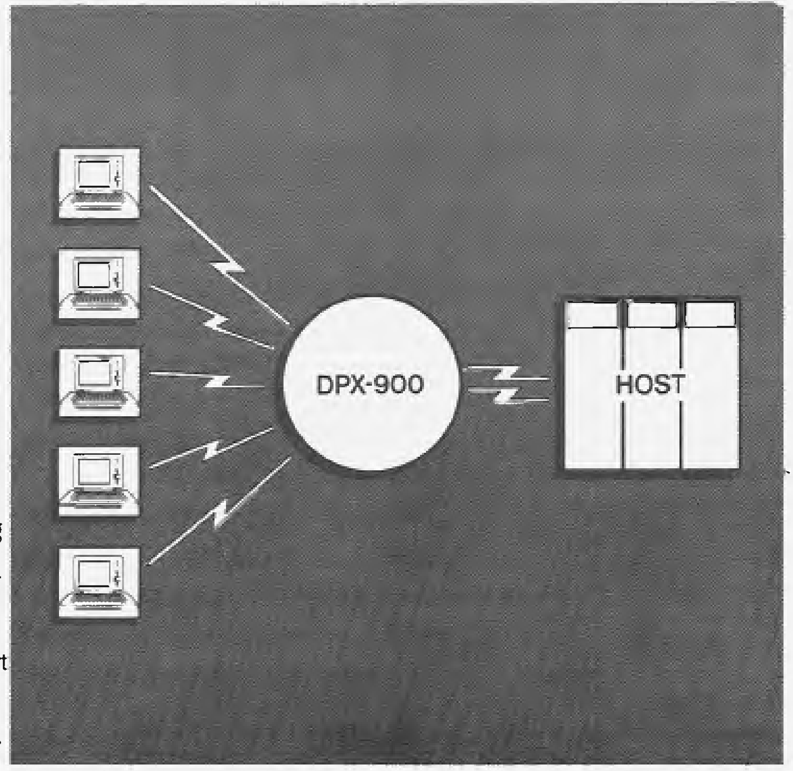
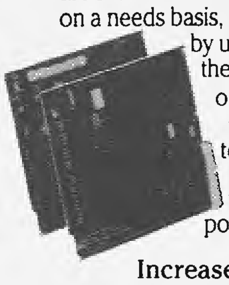
Data switches provide a flexible interface between terminals, PC's, peripherals and computers. Just as your PABX manages telephone connections, allowing any extension to call another, data switches perform a similar function for data communication.



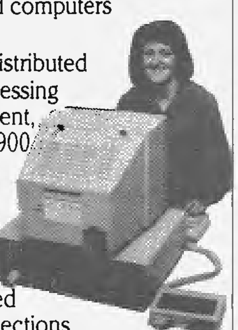
Buy fewer ports. Instead of being hard wired to a dedicated port, terminals are connected via a data switch. Computer ports are shared between users on a needs basis, reducing by up to half the number of ports needed to support your terminal population.



Increase port productivity. Because most terminals are really used for only a fraction of the time they are connected, expensive ports often lie idle for long periods. The DPX-900 reduces this idle time, resulting in much more efficient use of your existing ports.

Re-cabling, patching eliminated. Where two computers are running specific applications, the DPX-900 can be used to switch terminals from one to another. With simple keyboard commands, users can move freely between computers, avoiding re-cabling or manual patch panels.

Low cost LAN. The DPX-900 operates as a star connected local area network to connect PC's, terminals and computers using low cost twisted pairs.



In a distributed data processing environment, the DPX-900 can be used to network sites together. High speed interconnections between data switches allow users at every site to share all resources on the network, irrespective of their location.

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EDITORIAL

Telecom on the line

WHEN you are due to fly out of Australia within the hour for the biggest telecommunications conference either side of the Mason-Dixon line, you tend to wave away irritants such as Telecom "promises" of editorial non-co-operation like so many bush flies.

In fact there is a good chance of meeting, among the 200,000 visitors to International Telecommunications expected in Geneva for the show and conference between October 19 and 27, a good number of true Telecom Australia communicators.

However, let me state for the record that I consider it blatant and unwarranted interference in the professional work of a journalist to say quite openly "if you print this not only will I deny it but we will not give you any co-operation with news in future. On the other hand if you decide to suppress this information, which is going to hurt our marketing prospects if leaked, we will oblige with advance news of interest to your publication". Or words to this effect.

Now the point is that the original information I am referring to did not, repeat not, originate with Telecom, which is therefore ultra vires *by all rules of publishing etiquette in trying to put a lid on the story.*

Nuff said. Now for the good news. Communications World *is going from strength to strength, and we hope to offer you even better coverage of both carrier and user stories in the future.*

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CORE REPORT: modems

Speed is of the essence

THE shape of things to come is expressed succinctly if somewhat crudely in US modem advertising aimed at the business communications marketplace: speed is of the essence — and today it can mean only one thing: 9.6k-bit/sec and above. (The question asked rhetorically in the illustration is answered, practically, by modem specialists selling 2400bit/sec US Robotics modems for just $US169 by mail order — something that is increasingly worrying established local vendors.)

Two current standards reign at that data rate. CCITT recommendation V.29 which covers 9.6k-bit/sec modems operating full duplex over leased lines (four-wire) or half duplex over dialup lines; and CCITT recommendation V.32 for full-duplex use on dialup lines. (Owners or intending owners of facsimile cards for PCs might want to remember that they are getting a V.29 modem thrown in for good measure, so the opportunity for highspeed file transfers between PCs by phone may be an extra good reason to buy the fax card.)

Higher speeds are attained on the Public Switched Telephone Network by a variety of proprietary techniques, ranging from adaptive equalisation a la Netcomm Trailblazer to software emulation of full-duplex operation and packetising of asynchronous data in modems using the Microcom Networking Protocol (MNP). In both cases, transmission rates of around 18-19K-bit/sec are claimed possible. Modems of the MNP variety cost under $US1000 list, that is, Microcom's own AX/9600 Plus for $US999.

> *Another aspect of modems getting smarter is the introduction of network management for dial-up modems*

Modems are not only getting a lot faster, they are also getting a lot smarter: V.29 modems sometimes incorporate time-division multiplexing capability, a recommended option under the standard, offer an X.25 packet-switching option, or include such niceties as unattended automatic dial backup capacity. In this case the modem switches to PSTN operation by dialling two switched lines (for full-duplex) when the leased line link fails.

The other contender running under CCITT rules, V.32, is somewhat handicapped by its costly hardware echo cancellation and error-correction equipment but even here prices are slipping from last year's $A5000 for a Codex unit. In the US, prices are falling fast: a recent Gandalf Data offering intended mainly for metropolitan area networks, Access Series V.32, is software controlled, has automatic adaptive equalisation and uses HLDC error checking. It is compatible with V.22 (1200 bit/sec) and V.22bis (2400 bit/sec) and has a $US2295 list price.

The articles that follow should give users a good overview of what is happening in the exciting field of highspeed modems.

— *Luis Huesch*

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It transforms a remote async ASCII terminal into a full-function work-station able to run any software a local workstation can.

It automatically negotiates speeds with the calling modem to run at the fastest mutual data rate.

The VM24 model, in addition to the Race mode, offers V.22bis and MNP error correction is available at the 300, 1200 and 2400bps speeds.

The Race VM II features an independent, statistically multiplexed printer channel.

And the Race VM models start in price from only $2900 (rrp).

The Race BMX is ideal for file transfer applications. It enables error-free file transfer, over standard telephone lines, from PC-to-host or host-to-host at up to 1700 characters per second.

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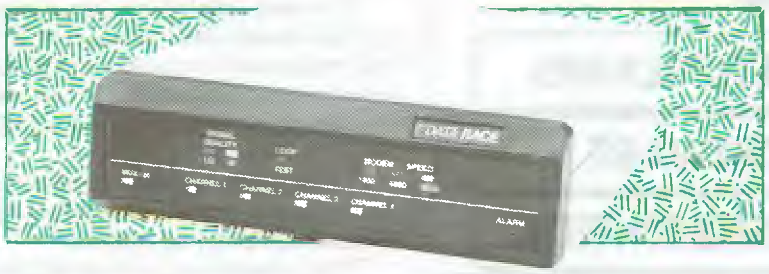

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CCITT accepts de facto standard

By Jim Brown

GENEVA — Deadlocked over competing error-checking techniques, a CCITT study group has decided to recommend a standard that incorporates both Microcom's Networking Protocol (MNP) and CCITT's Link Access Procedure (Lap).

The decision came after a two-week-long meeting here last month of the CCITT Study Group XVI, which is trying to settle on a recommendation for an error-checking scheme for dialup modems that transmit asynchronous data synchronously.

The group had planned to base the recommendation on either the MNP or Lap protocol. But after failing to reach a required unanimous opinion on either of the two protocols, the eight CCITT members voting on the matter decided to work toward a recommendation that combines MNP and Lap.

In order to have the recommendation published at the end of its study period in late 1988, the group was hoping to recommend a standard by year-end. But Belgium, Germany, France, the Netherlands, Italy, Sweden and IBM Europe put their weight behind MNP, while the UK and Japan pushed for adoption of a modified Lap. Because MNP was developed by a US company, the US delegation chose not to stand behind either standard.

As a compromise, the group agreed to incorporate MNP, as it exists today, into the recommendation. It also decided to freeze development of MNP and stipulated that an unspecified form of the Lap protocol and MNP Classes 1 through 4, which cover error checking, be outlined in the recommendation.

There are currently two Lap-based protocols in use — Lap B, a CCITT recommendation for Layer 2 of the X.25 protocol, and Lap D, a CCITT recommendation for the D signalling channel of Integrated Services Digital Network.

If the group accelerates the approval process, it could adopt a final recommendation by mid-1989, according to Greg Pearson, vice-president of technology planning at Microcom.

Even though both MNP and Lap will be included in the recommendation, the group can still decide to give one protocol more prominence than the other.

"This is the spirit of a compromise. Those who support the Lap protocol agreed to give a degree of status to MNP, while MNP backers effectively gave the future of error checking to Lap," said Dale Walsh, vice-president of engineering for US Robotics, a modem maker that employs MNP.

"What MNP gets out of this is status as a recommended CCITT protocol," said Walsh.

In the short term, the action is a shot in the arm for MNP, for which Microcom has lobbied heavily. However, MNP could lose in the long run.

By failing to include a current Lap method — Lap B or Lap D — in its recommendation, the CCITT Study Group will be able to develop a Lap method that incorporates enhanced error-checking techniques that improve on MNP.

"It's not clear what the Lap side of the recommendation will look like," Pearson said. "But, it will take so long to specify the Lap protocol, MNP will continue to proliferate as a de facto standard."

● *Jim Brown is New Products Editor of* Network World, *our US sister publication.*

Microcom makes much of MNP "standard"

EVEN before the CCITT decision, Microcom mounted a massive campaign designed to impress on users and potential OEMs alike the benefits of its high-performance Microcom Networking Protocol (MNP) "standard".

(MNP data compression is claimed to virtually double data transmission rates, up to 19.2k-bit/sec for the company's own 9.6k-bit/sec modem. Error correction is said to provide completely error-free transmission even on dial-up telephone lines.)

In its latest advertisement, a full page in our US sister publication *Network World* discussing "Why it became the standard", the company claimed an installed base of more than 150,000 for its highend AX/9624c modem alone, and said more than 40 other modem makers had adopted MNP.

Value-added networks such as US Sprint, Geisco, Infonet and the IBM Information Network support MNP. It operates with other common standards such as Bell 103 and 212A, CCITT V22, V.22 bis and V.29FT, negotiating the highest mutually supported speed automatically with a remote modem. Hayes AT modem commands and Microcom's own SX command set can be used.

According to the vendor, MNP Class 6 protocol offers the highest performance, with universal link negotiation and a statistical duplexing algorithm that dynamically emulates full-duplex transmission. In this case, more bandwidth is allocated to the side of the application that has the most data to send. Combined with data compression, it reportedly boosts effective throughput to as much as 19.2k-bit/sec, Microcom said.

MNP Class 5 uses data compression to analyse user data and adjust compression parameters, achieving 63 per cent compression and doubling rated modem speed in combination with other MNP features, according to the vendor.

MNP Class 4 provides Adaptive Packet Assembly said to generate larger packets over clean lines, reducing protocol overhead and boosting up to 122 per cent of rated modem speed. When error rates increase, smaller and smaller data packets are created to increase transmission efficiency. The maximum data packet size is 256 bytes, the minimum 32 bytes.

MNP Class 3 achieves higher throughput in conforming modems by wrapping asynchronous data in synchronous data packets, thereby reducing the number of asynchronous control characters that would otherwise have to be sent. Levels 3,2 and 1 of MNP are in the public domain.

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'Viable alternative to leased lines'

LOW-COST very high-speed data communications products are now a viable alternative to leased lines, according to Ian Fazio, management director of Shuttle Datacomm Pty Ltd.

High-speed error-free devices allow data to be transmitted over ordinary dialup telephone lines at speeds up to 1800 characters a second, fully error checked.

"It is now possible for companies requiring high-speed data transmission between their multi-user computers and remote interactive terminals or PCs to connect at a fraction of the costs incurred with leased lines," Fazio said.

The large number of businesses in multi-locations are heavily dependent on distributed computer operations.

These systems use numbers of interactive terminals located where the transactions happen — in the warehouse, at the construction site, on the shop floor, at customers' offices, at the agents depots and so on. These remote terminals are usually connected to their supporting computer via some form of telephone circuit.

Until recently the only options to operate remotely with relatively error-free transmission were to run at a slow 1200 bit/sec over low-cost dialup lines or to use expensive leased lines. Now several options are available.

One is to use 2400 bit/sec dialup modems. But conventional telephone lines become increasingly unreliable at higher speeds and 2400 bit/sec modems without builtin error correction produce high bit error rates and consequent unacceptable data, particularly in financial applications.

One way to overcome this is to spend more money and add on a hardware error correction device. This solution is acceptable in some cases, but is far from ideal.

An alternative solution is to try various software error correction programs. In the case of PCs these often are incompatible because different checking protocols are used by proprietary software manufacturers.

Unless identical protocols exist at both ends, error checking cannot be achieved, making communications between multiple user locations complicated. Also software solutions can slow transmission rates by up to 35 per cent.

If 2400 is fast enough for the application then it is best to pay a little more for a modem that has error correction such as sophisticated MNP protocols built in.

One effective solution for PC-to-PC users requiring higher than 2400 bit/sec remote data communications is to use a modem accelerator, a device that speeds up communication through standard modems, Fazio said.

A typical example of such a device, usually offered as an expansion board, incorporates a symbolic tokeniser which converts one word or phrase into a 15-bit binary token. With this compression technique, text can be transmitted in one third of the time and has the added advantage that it is stored in one third the memory space.

Of course there are many data communications users who, because of the very nature of their remote interactive data needs, require the highest possible error-free bit rates, yet find it impossible to use leased lines.

This applies in situations such as where

(Continued page 18)

The advantages of trellis modulation

By Karl Seitz

WITH the proliferation of interconnected computer devices, there is a growing demand for high-speed, high-throughput data communications devices such as high-speed modems.

Using analogue telephone lines, which continue to dominate, these modems provide efficient data transmission between various intelligent digital devices. Since the cost of data communications is dominated by the user's monthly analogue line charge, the use of high-speed modems maximises data throughput and substantially reduces communications expenses.

Until 1980, modems had a maximum transmission speed of 9600 bit/sec. For data transmission at rates higher than 9600 bit/sec, transmission over conventional telephone lines was impractical. In the early 1980s, first-generation modems with transmission speeds higher than 9600 bit/sec appeared, but these modems were incapable of high-quality performance. In 1984, the second-generation of modems using trellis-coded modulation (TCM) became available.

A primary design goal of this second generation of modems was to achieve greater throughput and reliable transmission at speeds up to 14.6k-bit/sec. These modems achieved acceptable error rates and overcame the signal distortion problems that plagued the first-generation products. In late 1985, a third-generation modem that runs on second-generation hardware and operates at 19.2k-bit/sec was introduced.

> *❛ The trellis-coded modulation technique was used to overcome the limitation of QAM ❜*

The third generation of high-speed modems improves the TCM techniques through more efficient, highly complex, multi-dimensional trellis algorithms. TCM modems enhance performance by adding error correction to the transmitted sequence of signal points. This provides considerable improvement over traditional quadrature amplitude modulation (QAM) methods.

In traditional QAM, a signal point consists of several bits of information. The QAM process starts with amplitude modulation of the digital signal. The subsequent analogue signal can then be shown on a two-dimensional diagram by using a pair of co-ordinates that represent each baud of information as a point. A group of defined signal points is called a signal constellation.

At the receiving modem, after demodulation, a pair of co-ordinates is generated. This received point can then be mapped on to the known constellation of signal points. If telephone lines were an ideal form of transmission, the received signal point would exactly overlay one of the point positions of the signal constellation. But telephone lines add noise and other distortions to the signal that prevent an ideal match with any of the standard signal constellation point positions. In low-speed modems, where signal constellatons are not densely packed, correct interpretations are possible with reasonable error rates.

Because high-speed modems require more signal points, traditional QAM methods are ineffective. As the number of signal points increases, they move closer to each other, making it more difficult to recognise the received signal point. The slightest distortion moves the received signal point into another, incorrect signal point position. To cope with this problem and provide high-speed, error-free transmission, new modulation techniques had to be used.

The trellis-coded modulation technique was used to overcome the limitation of QAM. To achieve their transmission results, TCM sends a redundant bit of information for error correction. This added information leads to a denser and more accurate, but also more error-prone, transmission.

When the dependencies between successively transmitted bauds are acted on by a decoding algorithm in the receiver, only certain patterns or sequences of signal points are valid. Invalid sequences cannot be transmitted. The ability to distinguish between valid and invalid sequences means that if noise or distortions disturb the received signal point sequence, the decoder can detect an invalid sequence and select the closest valid sequence to the one actually received.

Eight bits of information are transmitted during each baud. Since each eight-bit combination must be uniquely identifiable, this results in a signal constellation of 256 points. Each point is assigned to one of eight classes so that the decoding algorithm can ensure the greatest possible separation of successively transmitted signal points.

When the receiving modem obtains the signal point, it begins the process of recognition. One of the problems in recognising a signal point is that the position becomes distorted as it passes through the telephone lines and can be seen as being closer to the wrong point. A modem based on the QAM technique would assign the received point to the nearest constellation point, which in many instances would be the wrong point. TCM, however, employs a two-stage recognition process, which consists of a coarse stage and a fine stage.

During the coarse stage, the receiving

(Continued page 14)

"I want a reliable, high-speed connection to head office without incurring the high cost of leased lines. Can this be done simply?"

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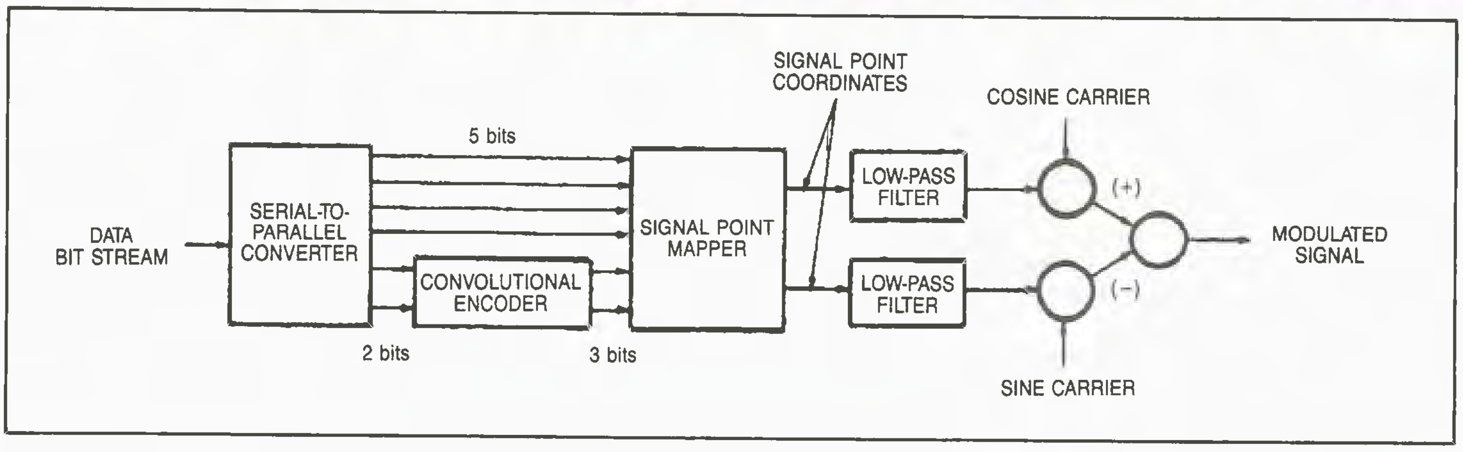
JNA
DATA COMMUNICATIONS

The advantages of trellis modulation

(Continued from page 13)



The trellis-coded modulation technique eliminates existing QAM problems and achieves transmission results. Each seven bit group of data coming into the transmitting modem is divided into two groups. The first group of five bits is untouched, while the second group of two bits is passed through a convolutional encoder where the additional bit of information is added. This extra bit introduced by convolutional code establishes the dependencies between successive signal points.

modem will select the closest signal point in each class as the most likely candidate to have been transmitted. Since there are eight classes, eight possible positions are identified. The distances between the received point and these positions are also measured and recorded.

During the final stage, more information is gathered on the eight points that are candidates. They are identified in their coarse stage by analysing dependencies introduced by the convolutional encoder. By taking into account past and present signals, the decoder decides which of the eight signal points was most likely to have been transmitted.

The convolutional decoding algorithm examines 16 successively received candidate points before making a decision on a received signal. Essentially, this algorithm is constantly looking backward, comparing already-received data with newly presented information. Second-generation modems based on the eight-state, two-dimensional, trellis-coded modulation scheme have exhibited excellent performance at speeds of up to 16.8K-bit/sec.

For speeds higher than 16.8K-bit/sec, more advanced modulation schemes are required. After exploring the various possible advances in modulation schemes. Codex decided to use an eight-dimensional TCM scheme. This scheme concatenates four two-dimensional signal constellations, then uses TCM to introduce dependencies in successive eight-dimensional signal points.

By using eight-dimensional TCM, not only is noise immunity improved, but the number of points in each of the four concatenated two-dimensional constellations is reduced from 256 to 160. This implementation eliminates the performance penalty of having to increase the number of signal constellation points which was once a problem for both coded and uncoded modulation techniques.

While the eight-state, two-dimensional TCM scheme has eight classes of signal points, the eight-dimensional TCM scheme has four classes of signal points in each of the four two-dimensional constellations. Since these classes are located in four concatenated two-dimensional constellations, the eight-dimensional TCM has 16 classes of signal points.

Although the eight-dimensional TCM is more complex than two-dimensional TCM, the receiver concepts of signal point recognition are basically the same. Also, the "backward-looking" mechanism is similar. Thus, the implementation of successive signal point dependency is similar in both two- and eight-dimensional TCM schemes. The beauty of the 64-state, eight-dimensional TCM scheme is that a small increase in complexity leads to a large performance boost. This type of TCM scheme shows an improvement of 5.4dB over an uncoded 128-signal point QAM scheme. This scheme also dramatically improves the error rate so that data transport is 99.9 per cent error-free when used over 90 per cent of the Bell Standard 3002 D1 lines.

Based on this design, the Codex 2680 has been able to double the transmission speed on analogue lines from the technological limits of five years ago. The Codex 2680 is currently the only 19.2K-bit/sec modem with integral network management and control and a set of diagnostics that improves throughput and minimises downtime.

- *Karl Seitz is a senior director of engineering at Codex.*

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Different standards causing confusion

By Allan Kepper

IN today's modem market there is an ever-increasing trend towards high-speed modems combining a number of CCITT standards in the one device. These modems, commonly dubbed Tri or Quad modems, generally use CCITT standards — V.22 bis/V.22/V.21/V.23 and allow one device to communicate with many others worldwide.

Still higher-speed modems are also becoming popular among specialist users and have been experiencing market growths of 80 per cent in some parts of the world. There are a few different standards emerging in this area causing conflict and confusion.

There are three basic types of technology used in the higher-speed modems (above 240 bits/sec. These are CCITT V.32, Fast Fourier Transform and CCITT V.29 "Ping Pong". All these modems use digital signal processing (DSP) which emulates analogue modulation and filtering techniques. V.32 is a standard specifying transmission protocols over the two-wire public switched telephone network, (PSTN) (and four wire leased line). This technique uses digital signal processing to modulate and de-modulate 9600bits/sec full duplex data transmission on to a two-wire line. Full duplex is simultaneous transmission in both directions at any one time.

To achieve full duplex operation, V.32 specifies that echo cancellation and trellis-coded modulation (TCM) is to be used, which introduces a high degree of difficulty. Echo cancellation is the process where the receiver in the modem (which is attached to the transmitter output) subtracts the local transmitter signal from what appears on the line, the difference being the true received signal (see Figure 1).

This is generally accomplished using the same DSP processes used in the transmitter section. Trellis-coded modulation is an advanced forward error correcting technique which significantly reduces errors in transmitted data caused by channel noise or other signal distortion. At 9600 bits/sec, TCM can provide greater than 3dB increase in immunity to noise over uncoded (non-TCM) schemes, minimising the need for re-transmission and so permitting greater data throughput. TCM (with some memory) allows vastly superior satellite or overseas telecommunications.

Fast Fourier Transform

Fast Fourier Transform is a relatively new technology (using old concepts) that is becoming popular but is not yet a standard. These types of units are again powerful computers solving or simulating complex mathematical models or concepts. CCITT V.32 and V.29 standards specified that 32 and 16 different phase and amplitude signals would be transmitted to represent five and four bit words, respectively (5 bits per baud and 4 bits per baud respectively).

FFT modems transmit many more bits per baud (achieving thousands of bits per transmission). FFT modems achieve this by analysing large "chunks" of data and converting this data into a frequency spectrum. The modem then performs a reverse Fourier transform to obtain an analogue signal which is transmitted to the other modem, where a reverse process begins. (see Figure 2). A Fourier transform is a mathematical process that separates the frequency components of an analogue signal. FFT is the Fourier transform being accomplished quickly by high-speed DSP techniques. FFT modem transmit at a very low baud rate (4 or 5 per second) but with 2000 or 3000 bits per baud, achieving data rates in one direction only of 12000 bits/sec. These modems generally are adaptive, that is they use a slow (say 100bits/sec) back channel to monitor performance. FFT modems currently have two problems. The frequency response of the telephone line may be poor or change and hence cause errors. When errors occur the whole packet of data (of 2000 bits or so) must be re-transmitted and, with a slow back channel, will reduce the throughput sometimes to below that of a V.22bis modem.

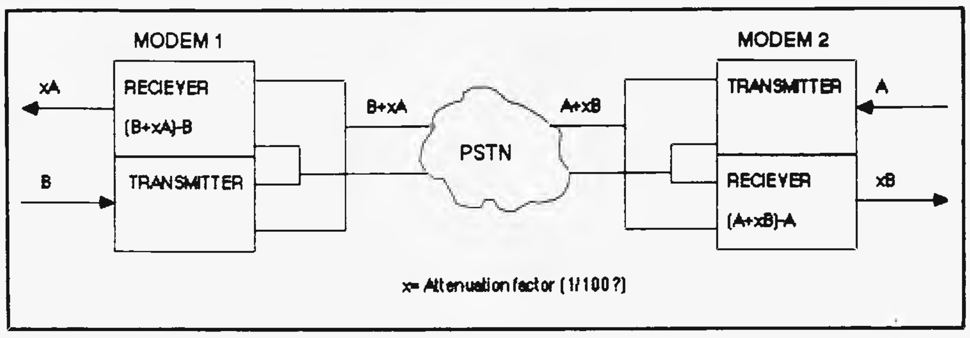

Figure 1

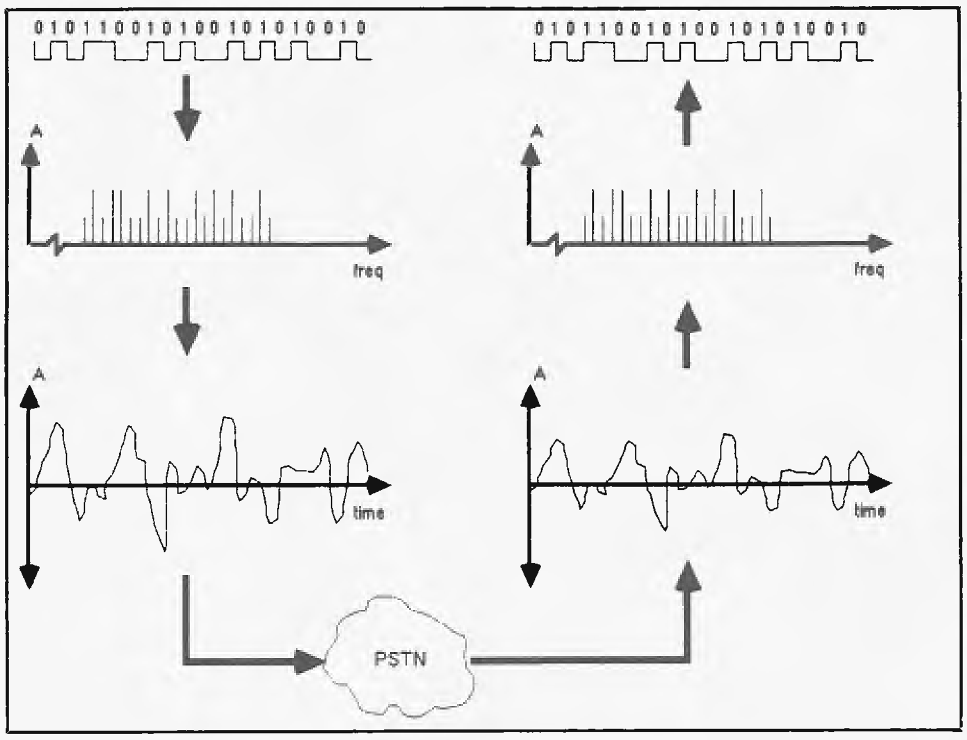

Figure 2

V.29 "Ping Pong"

The final series of modems are called V.29 Ping Pong. They use V.29 technology to achieve data rates of 9600bits/sec in one direction (half duplex). Some units use 9600 bits/sec transmission speeds in alternating directions (ping pong), with an expected full duplex throughput of 4800 bits/sec. On top of this, compression techniques are used to obtain 9600 bits/sec full duplex throughput but is significantly dependent upon the types of data.

Other units use 9600 bits/sec one way, 300bits/sec the other and alternate the set-up and together with compression techniques obtain transmission speeds of 19.2K-bit/sec one way (HDX) or 9.6K-bit sec full duplex. These units are not so dependent on the type of data than the former because control can be maintained using the back channel.

FFT and Ping Pong modems are best suited to applications where data only has to be sent one way. They are ideal for PC users wanting to transfer large amounts of data from one place to another. An application of such modems is where a remote engineering site required one-off detailed drawings of machinery which had to be sent from a central Cad/Cam centre in a capital city. The same modems were required at each end.

No longer the sole domain of the "technical user", CCITT V.32 modems are available today equipped with a full range of popular enduser features available from suppliers like Concord Data Systems. These modems are designed for applications in which interactive high-speed, full duplex communication is critical, including local and wide-area network applications.

● *Allan Kepper is product manager with Datacraft, who import the Codex range of modems.*

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High speed without high cost

By Rex Lehmann

COMMUNICATION standards are still proliferating at an ever increasing pace — a far cry from the last decade. The majority relate to digital transmission, but the benefits of analogue transmission are far from eclipsed. Publication of the CCITT V.32 recommendation underlines the ongoing importance of modems.

Where does V.32 fit into the user's networking requirements? Before answering this question, a little background may be in order.

For many years modems and other modulation techniques have wrestled with the error-prone world of the Public Switched Telephone Network (PSTN). To date, the hightest rate that "ordinary" modems can dispatch data over an extended distance on the PSTN is 2400 bits/sec. The more intelligent of these modems have the ability to detect errors due to varying line conditions and are able to drop their speed to 1200 bits/sec or 600 bits/sec to help ensure the delivery of uncorrupted data.

However, since long-distance PSTN calls are charged at regular Telecom STD rates, the slower the transmission speed, the higher the cost for the same amount of work.

For applications like file transfer, remote resource-sharing and remote Cad/Cam access requiring error-free transmission of high volumes of data, leased lines with their high fixed rentals became necessary. And it is those rentals that tend to restrict the availability of adequate data services to distant offices of organisations of all sizes.

What is required is a simple to implement, cost-effective and reliable method of achieving higher speeds without the high cost of leased lines.

V.32 is a major landmark in achieving that aim.

Modems built to the V.32 standard provide transmission speeds of 9600 bits/sec on a standard two-wire PSTN line. They incorporate advanced echo cancelling techniques and a modulation coding method designed to ensure that even substandard line conditions will not prevent rapid transmission of uncorrupted data.

We have all had the experience of hearing our own voice about three-quarters of a second after we begin to speak during a telephone conversation. This is an example of an echo. Research has indicated that we can tolerate no more than this level of echo delay over the phone.

Modems, however, cannot deal with any echo, unless they have been specifically designed to cope with it. For that reason, echo cancellation is needed for satisfactory transmission at speeds greater than 2400 bits/sec.

Since V.32 is a full duplex, two-wire specification both the transmitter and the receiver share the same bandwidth. As a result, the receive signal will be masked by the transmitted signal, unless the transmitted signal can be eliminated. It is the job of echo cancellation to eliminate this signal, plus all reflections of it.

Echo sources

In a dial connection there are two possible sources of echo: the local and remote terminations. A modem can be technically V.32 compliant using any echo cancellation technique available — and without necessarily cancelling both the local and (more difficult) remote echo. In the majority of transmissions, either over long distances or in satellite links, the presence of a remote echo will prevent satisfactory transmission. The US-built Codex V.32 modems offer both local and remote cancellation.

Full echo cancellation, therefore is necessary to ensure the operation of high-speed modems on standard two-wire PSTN lines.

To ensure your data arrives uncorrupted by "line noise" and "phase jitter" (which becomes critical above 2400 bits/sec), the V.32 recommendation permits a choice of modulation schemes for 9600 bits/sec operation.

The first technique developed was an uncoded modulation method which did not include any ability to correct errors. This has since been superseded by the Trellis Coded Modulation (TCM) scheme. TCM provides a sophisticated error-detection and correction method that results in quality data transmission.

With V.32 modems now available for less than $A5000, the high-speed dial access becomes a cost-effective alternative to leased services in a number of applications. For example, it now makes sense to back-up leased services of around 9600 bits/sec with a V.32 dial service, thereby avoiding the cost of a second leased line without sacrificing throughput. Also, this capability could give cause for some organisations to rethink their deployment of leased services, especially where some lines are only handling spasmodic transmissions.

Remote engineering works using design graphics on PCs, for example in the mining and construction industries, can easily and reliably transmit their high density bit-mapped computer designs simply by dialling through the PSTN.

Users merely have to weigh the considerably reduced time charges for STD-based transmission against the long-distance leased line charges to evaluate the increasing benefit of V.32.

- *Rex Lehmann is a strategic marketing manager with J N Almgren Pty Ltd.*

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'Viable alternative to leased lines'

(Continued from page 12)

engineers and similar operators work from remote locations, or in other situations where there is a high likelihood of it being necessary to change the location of the device.

Also it can be necessary to exchange large volumes of information intermittently, making the installation of leased lines uneconomic in the short term, and of uncertain benefit in the long term.

"It is evident," said Fazio, "that there is a growing data processing need for low-cost, dialup connections using very fast modems between dumb but fast interactive Ascii terminals, printers, PCs and multi-user host computers.

"The falling price and greater flexibility of large multi-user computers is creating a resurgence in low-cost more interactive terminal use.

"In most of these long-distance applications the user has been obliged to use Telecom's leased lines which involve expensive leasing and high installation cost,"

Basically there are two types of very high-speed, low-cost modems with Telecom authorisation available in Australia.

One type is a true full duplex modem which is ideally suited to interactive applications such as word processing, spread sheets or accounting. In these cases the data from a terminal or PC is usually in short bursts, and keyboard entries requiring a fast response from the hosts. Usually a 100ms or less turn-around time is necessary for efficient performance.

This type of modem employs a high-speed V.27TER (4800 bit/sec) and a low-speed (200 bit/sec) channel. The high speed channel is used for file transfers or screen data and the low speed channel generally is used for ACK, NAK and keyboard data entry.

The high speed channel direction in this type of modem is automatically controlled, based on data throughput requirements established by the connected devices.

Keystroke data and associated echoes are adjusted on both channels to ensure return echo in under 100ms

A version of this type has an option for an echo printer channel or statistically multiplexed printer interface which makes it possible for printers to operate concurrently with terminal or micro/mainframe communications, over the same dialup line.

One of the key performance factors in this type of modem is that only intelligent bits of data are transmitted, and then only after character compression. This can be achieved by using a proprietary data compression algorithm which can triple effective throughput of highly redundant characters transmitted over standard dialup telephone lines.

Compaction, or removal of unnecessary bits, saves about 30 per cent of the data and compression saves another block that can range from 25 per cent to a massive 2100 per cent, depending on the data. A typical 1980 character screen only uses between 700 and 1000 characters.

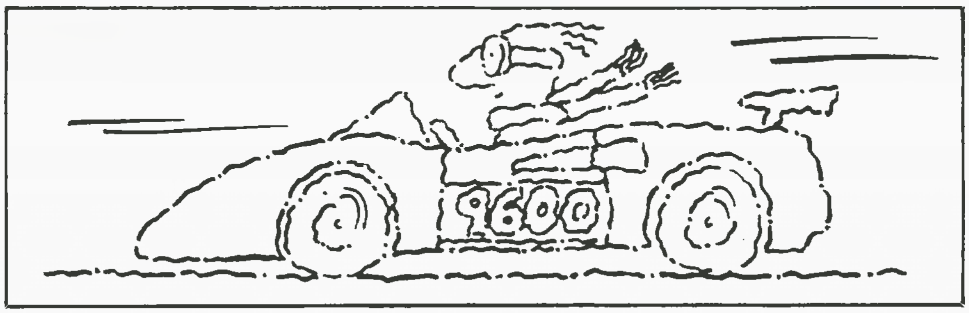
With a normal 1200 bit/sec modem it takes about 16.5 seconds to "paint" the screen, where this type of modem can do it in less than three seconds.

The second type of very high-speed modem is a "simulated full duplex", or a half duplex with fast turn-around, designed essentially for file transfer applications, block mode terminal applications or character mode terminal emulators.

While this type of modem also will perform in interactive applications it will not be as efficient as full duplex operations because echo or turn-around from keyboard input to screen display is substantially slower.

These modems employ V.29 (9600 bit/sec) standards and can transfer files at speeds up to 17,000 bit/sec, depending on the block size and compressibility of the data.

Modem protocol the best of both worlds?



AS reported earlier in this issue, the CCITT has cast its vote for a compromise on error-correction for dialup modems. But the arguments presented here by Concord Data Systems chairman, Ken Miller, are still valid, pointing as they do to the possible evolution of the Lap D part of the intended standard.

THERE has been much confusion and discussion in the past year about asynchronous error-protection protocols, particularly the Microcom Network Protocol (MNP) and X.PC.

Asynchronous protocols have no error-correction capability, so there is a need in some applications to protect asynchronous data when it is transmitted over the dial network.

There are two applications to be addressed. The first is data terminal equipment (DTE) to DTE, which includes applications such as terminal-to-host, personal computer-to-personal computer, personal computer-to-database, and others.

In all cases, the connection uses the telephone network without going through any public data network. This application needs error-protection capability in some critical applications.

The Consultative Committee on International Telephony and Telegraphy Study Group XVII and the US Electronics Industry Association (EIA) TR 30.1 (formerly the US Modem Working Party) have been considering two alternative protocols to meet this application: MNP and a modified form of Link Access Procedure D (Lap D).

> *‘It should be a requirement of a CCITT-approved error-protection protocol that the frames be sent as synchronous frames, including the initial handshaking’*

MNP was developed by Microcom, which has licensed it to third parties. Lap D is a high-level datalink control-based link-level protocol that has been approved by the CCITT to be the link-level protocol for the emerging Integrated Services Digital Network standard.

Thus, Lap D could serve in the future as a tail circuit into ISDN. Lap D also has multiplexing capability at the link level, a capability not present in MNP.

The second application type is dialup extension of public packet-switching networks based on X.25. In this application, the X.25 protocol in the X.25 network is extended over the dialup network.

Packet addressing (layer 3) allows multiplexing in the modem at the remote location. This provides the ability to support multiple sessions on the network with one dial call.

Two error-protection protocols are targeted application: X.PC, developed and promoted by Tymnet/McDonnell Douglas Network Systems and X.32, recommended in 1986 by CCITT Study Group XVII.

X.PC specifies packet assembler/disassembler functions in the protocol and thus supports asynchronous interfaces. X.32 is an HDLC-based synchronous protocol, but, with the addition of Pad functions, it will support equivalent asynchronous interfaces.

It should be a requirement of a CCITT-approved error-protection protocol that the frames be sent as synchronous frames, including the initial handshaking. Since MNP uses asynchronous frames in the handshaking, any protocol selected under this resolution will be incompatible with the installed MNP base.

Lap D uses a proven, HDLC-based protocol and is similar to X.32, so both application problems are easily implemented by a modem vendor.

Modems that address both the DTE-to-DTE and dialup extension applications are being marketed now. However, most use one or both of the dissimilar, asynchronous MNP and X.PC protocols.

Users would be better served by vendors if modem protocols supporting these applications were based on similar international standards.

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Intelligent phones may leave you smarting

By Steve Moore

WITHIN the next 10 years, new public network signalling and switching technologies will, paradoxically, both aggravate and eliminate the telephone tag problem. Ultimately, calls to those who want to be avoided may never be completed, while calls to parties who do wish to speak with the caller will seldom fail to reach their destination.

New calling options, because they may revolutionise the way people conduct their everyday business, will raise ticklish new regulatory questions. The basis for this future ferment lies in the new signalling services that will sneak in under the ISDN umbrella. These services will become available as PTTs slowly deploy equipment that support Signalling System 7, a new common channel signalling scheme that enables information about specific calls to be communicated, stored and manipulated.

Such services, built largely on the capability to identify the number of the calling party, open up seemingly endless new communications possibilities. You may simply purchase a phone set that displays the calling number. Then, if you know the number displayed and associate it with an individual, you can anticipate what to say — or choose not to answer. With a more sophisticated handset, you could create a database of all the people in your little black book, and the phone would display their names, numbers and other information about them when they call.

Next comes call screening, which enables you to accept or reject calls selectively. With sophisticated software, you could build a labyrinthine screening system. Some callers might never hear anything but a busy or ringing signal; others might be diverted to an answering machine.

If calls are diverted to a voice-messaging system, customised messages could be delivered to individual callers or groups of callers before the system allows them to leave their messages.

Distinctive rings

Finally, the calls you want to take would be allowed to ring. Particularly important callers could be assigned distinctive rings and perhaps even distinctive call-waiting tones.

Eventually, your phone number will go with you wherever you go, as long as you periodically update the intelligent network on your whereabouts.

But what if, when you actually allow some number to ring your phone, you are not able to answer it before the caller hangs up? Channel #7 services will also include last-number redial, so you will be able to call the last number that dialled you and find out who it was.

If you call that number only to reach an obnoxious salesperson or a crank caller, and that individual will not reveal where the call is coming from, do not worry. Channel #7 services are also expected to include the ability to trace calls. Either on your own or with the help of the phone company, you will be able to learn the location of the caller and complain to the Corporate Affairs Commission or the police. And, of course, you will enter the number into your call-reject database.

Widespread use of call-rejection options conjures up visions of calls bouncing around the network, being diverted from phone to phone, tying up network facilities until they either are abandoned or finally reach some unlucky recipient. Random number diallers, now used principally by telemarketing companies, could be used to foist unwanted calls on to unsuspecting third parties. While this last scenario may be unlikely, it seems certain that State and Federal regulators, users, carriers and equipment vendors will square off in hot debates on Channel #7 related questions:

- Should the caller identification system be universal and automatic, or should telephone users be allowed to prevent their phone numbers from being revealed to others, depending on who they are calling?
- At what intervals, and over what maximum period of time, should automatic number redialler be allowed to operate? Conceivably, a persistent caller whose number you have instructed your phone to reject could tie up your phone by instructing his phone to dial your number continuously for several hours. However, you might not be aware of it since the calls are all being rejected.
- With automatic reconnect or dialback, the intelligent network may provide callers with the capability to keep several callbacks going at once. But how many simultaneous callback processes should each user be allowed to maintain, given that each such process incrementally ties up network facilities?

The BN 308 phone

- Should there be any limit on the use of automatic call forwarding devices? Should phone company databases store complete line-history memories on calls that have been forwarded one or more times, so they can be traced?
- Should there be restrictions on the ability of phone subscribers to trace calls? Should phone companies be allowed to control the call-tracing function by requiring that they, not subscribers, actually conduct the trace? Which is the invasion of privacy: an unwanted call, or the tracing of that call?

Users should keep abreast of Channel #7 issues and make their desires known as debates over specific services heat up. If these services evolve in an equitable manner, businesspeople may finally gain precise, direct control over their telephone comunications.

- *Steve Moore is features editor of* Network World, *our US sister publication.*

Many are upgrading and throwing out their existing computer system.
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HP salvo of products

(Continued from page 7)

the Distributed Naming Service it announced at Decworld; IBM has none."

HP plans to introduce PU2.1 support for the HP 3000 "whenever IBM announces PU2.1 support for the 9370," so that HP minicomputers can take part in an IBM peer-to-peer network of departmental processors, Guidon said. No time frame was given for HP support of the IBM Token-Ring network.

Netbios support allows any application written for the IBM PC networking protocol to access files, peripherals and various office automation services on an HP 3000 running Officeshare. While IBM recently ceased directly selling or supporting Netbios, it "is still the de facto standard, with hundreds of applications written for it," Guidon said.

HP also announced:

- The HP 10M-bit/sec Lan Bridge, a local-area network product, available now, which provides a connection between two HP Ethernet backbones.
- The HP-UX SNA 3770 for batch-file transfer betwen HP UX systems and IBM mainframes, to be available in the first half of 1988.
- HP Network Services/Release 2.0 for the Vax allows HP 9000 systems to communicate with DEC computers using Telenet, a virtual terminal application written for Transmission Control Protocol/Internet Protocol (TCP/IP). The release is set to be available in the first quarter of 1988.

HP UX systems are now certified to run over Techway's Hyperchannel, a 50M-bit/sec channel-based network. With Hyperchannel maker Network Systems' Netwx software, HP UX systems can communicate with any other host running Netex.

Hewlett-Packard Australia had not yet announced local availability and pricing at press time.

New Idea in terminals

BILLERICA, Mass — Ideassociates, which used to concentrate on PC-based emulation products for IBM minicomputers, has expanded its offerings to include terminals designed for use with IBM System/3X processors. The company claims its Idea 197 terminal series is functionally superior to the IBM 3197 monochrome display.

Ideassociates President Gautum Gupta said the highend Idea 197-PT terminal allows any serial or parallel PC-scale printer to emulate an IBM 5219 system printer. It also reportedly allows emulation of the IBM 5224 and 5225 printers with graphics support and emulation of the IBM 5256 printer.

The Idea 197-PT and the Idea 197-2 include a split-screen capability that allows users to view two host sessions simultaneously. The Idea 197-1 features one IBM 3180 display session. The terminals include a 14in display, 80- and 132-column display modes and international keyboard support for 122-key keyboards.

Australian subsidiary High-Technology Communications has not yet announced local availability.

New connectivity software lets Excel users tap mini databases

NEW YORK — Within days of Microsoft's launch of its Excel spreadsheet for the PC, Network Innovations Corp introduced connectivity software that allows data in a minicomputer to be downloaded and integrated into Excel.

Called Multiplex/XL, the program is an Excel add-in that directly links Excel spreadsheets with databases residing on departmental computers. The program is compatible with DEC's Vax/VMS as well as Unix-compatible systems from AT&T and Sun Microsystems.

Users request data from a host application by entering industry-standard IBM SQL queries directly into the spreadsheet. Users can also access host data from a pull-down menu that has a list of predefined host database requests, a company spokesman explained.

Once the query has been executed, Multiplex/XL creates an Excel document containing the query results that can be brought directly into the current spreadsheet, the spokesman said.

"For the first time, it's possible for PC users to retrieve and update one or more tables in a host data base from within a spreadsheet application," said James Groff, president and co-founder of Network Innovations.

Excel and Multiplex/XL communicate through the Dynamic Data Exchange (DDE) protocol, a new feature in Microsoft Windows 2.0 for interapplication connectivity. Users can call on an Excel macro to pass requests from the spreadsheet to Multiplex/XL via the DDE protocol, the company said.

Multiplex/XL automatically establishes a connection with the host database in the background and executes the query while the personal computer user continues to interact with Excel on the micro. When the query is complete, Excel automatically notifies the user and incorporates the results.

The package costs $US99 per PC, with between $US3000 and $US18,000 host CPU licence fee, depending on the host system.

In addition to Multiplex/XL, Network Innovations recently introduced Multiplex/PC for Oracle, software that links packages such as Ashton-Tate's dBase III to Oracle Corp's Oracle databases on PCs. Multiplex/PC costs $US195 per micro and host licence fees ranging from $US695 to $US18,000.

PS/2 cards tipped to add at least 14 CPUs

By James Martin

BURLINGAME, California — A new generation of add-in boards, expected early next year, will piggy-back multiple microprocessors on to the Micro Channel architecture bus in IBM's PS/2 computers, providing networking, multitasking and multi-user performance not previously possible on a microcomputer.

The add-in boards, currently in the works by AST Research, Quadram, Cumulus Corp, Orchid Technology and others, will enable users to add at least 14 additional microprocessors to PS/2 Models 50, 60 or 80.

For example, the advanced boards will allow the PS/2's main CPU — an Intel 80286 or 80386 microprocessor — to off-load routine, time-consuming I/O (input/output) tasks to concurrent processors in order to increase throughput and performance.

When the necessary multitasking software interfaces become available, these boards will reportedly allow a PS/2 to accommodate multiple operating systems, including Unix, without significant performance loss. "You could conceivably have Unix and MS-Dos in the same machine just by dropping in a processor board," said Bob Kutnick, director of strategic projects at AST.

A 68000 processor board could easily interface to IBM's global bus by adding "the logic required to make the 68000 bus talk with the Micro Channel bus," said Jim Reinhart, manager of applications engineering for the 68000 series in Motorola's semiconductor product sector in Austin, Texas.

The first of these "multiple processor" cards was expected to be announced by AST. The company plans to unveil an enhanced hard disk controller board with its own microprocessor that will handle multiple disk requests simultaneously. The company would not specify which microprocessor it would use.

By early 1988, a new generation of add-in cards is expected to unfold with a focus on enhancing networking, graphics processing and multi-user applications on the PS/2.

"When you drop in a processor card, you get double the throughput without the burden of software overhead," Kutnick said.

Unlike previous IBM Personal Computer AT bus structures, the Micro Channel architecture features a Multi-Device Arbitration interface with the ability to support up to 15 arbitrating devices. These devices, according to the Micro Channel specifications manual, can range from "intelligent subsystems" to "concurrently operating processors".

"To visualise the power of this feature," wrote Micro Channel architect Chet Heath in a recent technical journal, "consider a 'spreadsheet engine' where seven concurrent processors are added to the system processor and the application separates the spreadsheet matrix and portions out pieces to each of the eight processors."

Cumulus will lean toward the multi-user environment with its initial board offerings, said Martin Alpert, president of the Cleveland-based start up. He said Cumulus multiprocessor boards would begin to appear within six to eight months.

Such boards will be "helpful in network environments and in hanging dumb terminals off a (PS/2) Model 60 or 80," said Bill Berkman, product manager for Orchid Technology. "They would also be helpful in super number-crunching environments."

However, developers said, software availability and cost factors could hinder the success, at least initially, of concurrent processing boards.

Not expected

"With some of these boards, it will be almost like buying a separate computer, with retail costs around $US1100 to $US1500," Berkman said.

In addition, software programs that bring the full capabilities of the Micro Channel architecture's concurrent processing environment are not expected for at least a year.

In order to run Unix and MS-Dos or OS/2 operating systems on the same machine, for example, a software interface is required. "The real difficulty is in getting the two operating systems to co-operate, not the processors," said Motorola's Reinhart. "The board vendors or a third-party software vendor looking for a good new market would have to build an interface between the operating systems."

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Banyan Vines climb higher

By Patricia Keefe

WESTBORO, Mass — Banyan Systems has announced Release 3.0 of its Vines distributed network operating system, featuring expanded network management and security capabilities.

Vines 3.0 will provide full support for MS-Dos 3.3, Transmission Control Protocol/Internet Protocol (TCP/IP) and several new networks, including Western Digital's Starlan and Micom-Interlan's NI5210 Ethernet card.

Early users were enthusiastic: "It's just a phenomenal security package," said Jerry Short, manager of Court Consultative Services for the Judicial Council of California. "It's what we have asked for."

Analysts also praised the new offering: "Banyan has kept pace with the competition in some critical areas," said Michael Goulde, a senior analyst with The Yankee Group in Boston.

In some cases, Banyan has gone beyond that competition, he said, citing Vine's ability to do network diagnostics from anywhere on the network across multiple servers.

When Vines 3.0 is delivered in December, Banyan will also ship two products announced earlier this year that require the latest release of Vines: Vines/386 for Intel 80386-based servers, and Vanguard, a security package.

Integrated with Vines' Streetalk distributed naming service, Vanguard features include audit trails, reporting tools, password encryption, user expiration dates, dialin limitations and restrictions on users' ability to change their network profiles.

Delivery to customers with support contracts will be free. Options such as Banyan Mail, mainframe and mini connectivity features, TCP/IP, network personal computer printing and new local-area network support are priced separately.

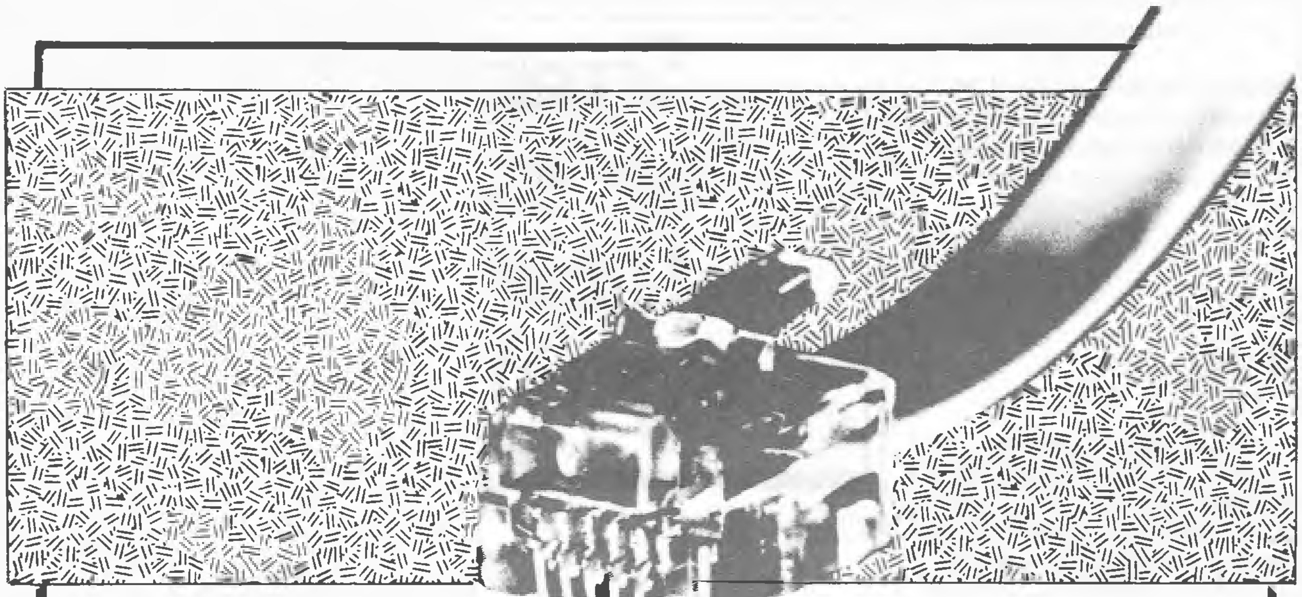
The announcement included the following:

- Two TCP/IP options: server-to-server communications, which allow users with a backbone TCP/IP network to connect remote Banyan servers; and a routing option that permits Banyan servers to route Internet Protocol frames, saving users the expense of dedicated routers.
- Faster small-file transfers. The round-trip time for file-record access has been reduced by two-thirds from that of Release 2.1, Banyan claimed.
- Banyan Mail. Improvements reportedly include external mail-system addressing, as well as the ability to add components to forwarded messages, to include PC/MS-Dos text in mail messages and to view information attached to messages without having to edit mail. Users with incompatible word processors can read each others' documents.
- Host connectivity. Users have the option of a hot-key switch between IBM 3270 sessions and PC/MS-Dos applications. Also added were up to four simultaneous logical unit sessions, asynchronous terminal emulation, scripting and compatibility with Crosstalk XVI scripts.
- Maintenance. Features include new system administration and management tools, including a "group move" facility and improvements to Banyan's access rights list.
- Reliability. Administrators can use read-after-write disk verification with dynamic bad-block remapping.

Not mentioned was support for IBM's LU6.2, which was promised for this release of Vines. A source explained that Banyan decided to give LU6.2 to developers first to generate useful, distributed applications.

And although some users will want to deploy IBM's PS/2 Model 80 as a file server, Vines/386 will not immediately support the Micro Channel architecture on the server side.

- *Patricia Keefe writes for US* Computerworld.



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Integrated range helps X.25 choice

(Continued from page 6)

to access a variety of networks including SNA, JNA introduced three PC boards that provide host, Lan and X.25 connectivity.

Bloch explained the rationale: "There is a limited number of networking products generally available for interconnecting PCs and PC Lans over a wide area. Megapac-PC provides a versatile, functionally rich, access method for these users into larger networks."

The cards — which use an independent MC68000 processor so the user can operate network and gateway communications functions totally in background mode — are designed to work in PC XT AT or PS/2-type machines (OS/2 versions are to be shipped early next year). A single PC running Netbios or Novell Netware and equipped with Megapac-PC reportedly gives all PCs on the Lan access to host running SNA, DEC, Honeywell, HP or Unisys protocols, as well as to other Lans via a remote PC similarly equipped.

The gateway PC is said to support up to nine concurrent host sessions in background mode. SNA support includes 3270 and 525 emulation and QLLC support for IBM's Network Packet-Switching Interface (NPSI).

"The major benefits of this approach are that a user can access SNA and asynchronous hosts from the same workstation simultaneously," said Bloch, "and there is no protocol conversion involved."

Megapac-PC comes in three configurations. A 256K-byte version is intended for standalone PCs and Lans where no more than eight users require simultaneous access. This board is said to provide gateway functions for up to 32 concurrent sessions for the Lan. A 512K-byte version reportedly serves up to 256 Lan users simultaneously offering various gateway facilities.

MM sets up Lan subsidiary

SYDNEY — Australia's largest cable manufacturer has entered the rapidly growing local area networking market with a purpose-built subsidiary that hopes to capture a third of the baseband segment with the UK-designed Isolan range of mixed-media products.

The new company, Austral Data Networks (ADN), is a subsidiary of Metal Manufactures Ltd (MM) — one of Australia's top 100 companies with annual sales of $A1200 million — whose major shareholder is UK-based multinational BICC Plc. The UK company, one of the world's largest cable and component makers, established its own networking subsidiary Bicc Data Networks (BDN) in 1984.

BDN is directly represented in Europe and the US and claims to be a leader in networking technology in its markets, reportedly having 30 per cent of the UK market, 20 per cent of the European market and "a substantial foothold" in the US. Its equipment is produced under subcontract because BDN prefers to concentrate on developing new technologies and factoring out manufacturing.

Austral Data Networks will import BDN's range of Ethernet and fibre-optic transceivers, repeaters, gateways and hubs as well as PC controller cards and specialised Lan software. It will sell these in conjunction with copper and fibre-optic cables and connectors produced locally by MM's Austral Standard Cables subsidiary to offer "one-stop, off the shelf" shopping to OEM's, value-added resellers and large users in Australia and New Zealand. Support and user education on IEEE 802.3 standards will form part of ADN's service.

Brian Hartley, who manages the new Sydney-based company, said the group's research pointed to a $A10 million/year baseband Lan market. He agreed that the estimate may have been rather conservative, saying the market was growing rapidly and showing "enormous potential". Hartley said local manufacture of Isolan products could follow, particularly if overseas equipment vendors chose to offer the product as part of their imports offset obligations.

Sales manager, Paul Kelly, said the international success of the Isolan range was due to its strict adherence to ISO standards. The BICC group had eight full-time staff involved with standards committees and standard tracking, and products were being offered only in areas where standards had stabilised, such as 802.3.

But it was corporate strategy to offer a complete range of Lans, and new interfaces such as FDDI for 100M-bit/sec fibre-based nets would be introduced as soon as the standard was set, Kelly said.

Other corporate aims were to promote the use of mixed media, to pursue guaranteed compatibility across the vendor spectrum, to boost opportunities for internetworking and to enable migration to metropolitan and wide-area networking.

Asked why the BDN range did not include a Token Ring interface, Kelly cited the cost advantage of Ethernet but said Token Ring support would be offered "if the market demands it".

AT&T to announce primary rate service

By Elisabeth Horwitt

BASKING RIDGE, New Jersey — AT&T will announce before year's end the first ISDN Primary Rate Service to be offered by a major US carrier.

The service could finally provide corporate MIS managers with the practical Integrated Services Digital Network (ISDN) applications they need to justify the potentially heavy costs of implementing the standard, industry sources claimed.

The Primary Rate Service allows customer networking devices to consolidate up to 23 (32 in the CCITT world outside North America) 64K-bit/sec channels on to a single T1 (1.54M-bit/sec, the US equivalent of the 2.048M-bit or M2 CCITT standard) line to the nearest carrier-switching site. From there, the channels can be either routed together to another customer site or fanned out to different destinations over a broad variety of digital services.

A key feature of the AT&T service will be the ability for users to dynamically allocate channels to different services on a call-by-channels on a call-by call basis.

TRW plans to "aggressively use the Primary Rate Service as soon as it becomes available to us" as a way to "switch any given channel from one service to another as users' requirements change," said Kenneth Jankowski, the company's network services manager. ISDN makes this possible by setting up an interactive communications link between customer-premises equipment and carrier-switching systems.

TRW, which now uses the full range of AT&T digital services, including its Software Defined Network, looks forward to saving on access charges by "consolidating our communications requirements over a Primary Rate Interface," Jankowski added.

The introduction of the ISDN equivalent of high-speed T1 links could accelerate user acceptance of ISDN in the US, "which depends on large corporations who won't fuss around with (AT&T's currently offered) Basic Rate services," said Thomas Nolle, president of consulting firm Cimi.

industry outlook

NEW YORK — New York investor Asher Edelman has offered to buy all of the remaining shares of Telex Corp for $US65 a share or approximately $US870 million. Edelman already owns 8.1 per cent of the Tulsa telecommunications company. The tender offer expires at midnight on November 6.

SANTA CLARA, California — Capitalising on the current high demand for personal computers and workstations, semiconductor maker Intel Corp has reported a highly profitable third quarter with sales of more than $US500 million. Operating profits of $US52 million, or 29 cents per share pushed revenue up 55 per cent from 1986 levels. In the same quarter a year ago, Intel lost $US114 million, or 65 cents per share, on sales of $US324 million.

HACKENSACK, New Jersey — Intelligent Information Systems has added to its line of IBM 3270-type terminals with the announcement of the IS-392D workstation. The IS-392D is designed to be plug-compatible with the IBM 3192 Model D display station which was announced in February. The IS-392D is interchangeable with the 3192 Model D via coaxial cables and IBM 3174, IBM 3274 or Intelligent Information Systems communications controllers. The monochrome screen offers four user-selectable display formats and the capacity to display 3564 characters, a printer port, enhanced record/pause/playback of up to 1500 characters and a rule function. US recommended retail price is $US1595.

FRAMINGHAM, Mass — Interchange Systems has developed an enhanced DEC Vax version of Netpay, an electronic data interchange package that standardises how financial institutions exchange documents.

Netpay was originally developed as an IBM PC/AT system that handled bank payments for General Motors Corp and its suppliers.

The current package is said to process the full range of documents supported by Ansi X.12 protocols. The system is priced at $US125,000 and is scheduled to be available in this quarter.

SAN JOSE, California — Digital Microwave Corp has announced a technology transfer and marketing agreement for its 23 GHz narrowband and 18 GHz wideband microwave radios and fibre-optic transmission products with Microelectronics Technology Inc (MTI) in the People's Republic of China. The agreement calls for the transfer of select manufacturing operations to Taiwan and marketing of equipment within China. Initial delivery of equipment to customers in Taiwan will begin immediately.

TOKYO — Bullish demand from Nippon Telegraph and Telephone Corp (NTT) procuring switches and carrier products for the debut of its ISDN system next April helped push up Japan's production of telecommunications gear 14.8 per cent in July to $US1230 million, compared to July 1986. According to a recent Communications Industries Association of Japan (CIAJ) report the total, wired communications gear output, including telephone sets, still-frame video equipment, and private-branch exchanges, amounted to $US .8 million), up 14.3 per cent. Radio communications products including mobile phones totalled $US246 million, up 16.7 percent.

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DEALER ENQUIRIES WELCOME

Australian revs up US acquisition

By Carole Patton

NEW YORK — We all know the story about Henry Ford in the early days of the automobile industry: He offered cars in any color you wanted — as long as it was black. After all, there wasn't too much competition in those days. Similarly, for the past 20 years Ryan-McFarland has offered its customers standard Cobol and Fortran compilers and tools.

No more. The plain vanilla era ended last June when Les McNeill, the lanky head of Austec Inc, a company with roots in Melbourne, Australia, bought Ryan-McFarland and began spicing up its software offerings.

Nowadays, McNeill is waltzing Cobol and Fortran into the heart of the networking environment, planning a relational database product using SQL (instead of just connecting his product to somebody else's), and expanding into new languages such as Modula 2.

At the recent Info '87 show in New York, Austec showed off the first of its Master series, a high-level Cobol compiler with a complete development toolkit.

McNeill's history in the computer industry goes back to the mid-1970s, in Melbourne, where he ran an applications consulting company. By 1980, McNeill said, he spotted a trend toward "non-proprietary" software that could move smoothly from one brand of hardware to another. He determined that a move to the US was in order.

So in 1982, McNeill sold off the applications software business — though he kept the research and development unit — and moved Austec's world headquarters to San Jose, California. A virtual holding company, Austec Inc Ltd, was left behind in Melbourne to oversee the company's operations in the US, Europe, and the Far East.

Austec began eyeing Ryan-McFarland in January 1987 and by June had completed the deal. Now, more than four months after the paperwork was finalised, McNeill is putting the combined Ryan-McFarland/Austec house in order and developing a five-year strategy.

"The acquisition hasn't been smooth sailing all the way . . . It never is," said McNeill. But most problems have been operational ones. McNeill feels Austec has to revise its contracts, add new products, broaden its markets, and change its distribution channels — in short, do everything — overnight.

"People accept change if it's part of an acquisition," he said. "They expect it. But if it goes on for six months, we'll have to fight for the changes we want."

Austec's new emphasis is on manufacturing software for resale and volume marketing. "We're getting away from those large-scale, one-of-a-kind engineering projects Ryan-McFarland used to do. They're fatal for a company like Austec," McNeill said.

McNeill also believes the PC is the gateway to tomorrow's computing world. Processing and information access should reside on the desks of the individuals making decisions, he said. Thus much of Austec's strategy is based on Cobol's transportability down to the micro level and the way it solves nasty networking problems.

Meanwhile, McNeill said, Austec is a US company now. "The truth is, only about 30 per cent of our R&D is being done in Australia now," he said. "We've become an importer of technology, not an exporter."

- *Carole Patton writes for Infoworld in the US.*

Networking company moves HQ east

By Graeme Philipson

SYDNEY — Perth-based data communications company Computer Protocol is moving its headquarters to Sydney to take advantage of increased marketing opportunities in the eastern States.

"In the last two years we have won some major contracts in NSW, Queensland and Victoria," said Computer Protocol's Australian manager, Philip Epthorp. "It didn't make sense to be headquartered in Perth."

Major Computer Protocol customers include CML, the Queensland government, Telecom, and the NSW Department of Main Roads. The company specialises in providing vendor-independent networking between disparate hosts, and was founded in Perth in 1979 by Darrold Cortes.

"By Christmas we hope to have twenty people in the Sydney office. We will be hiring locally, and not importing staff from Perth," said Epthorp. "We are embarking on a major expansion project, and expect to be able to announce a new financial relationship with a major investor in November. They will have equity, but they will bring us increased access to government, and their own development skills, as well as money."

Computer Protocol has also opened an office in Canberra, and expects one-third of its revenues over the next two years to come from the Federal government.

"With the wide disparity of equipment in government, and the recent merging of many departments, it is extremely important that they get their computers talking to one another. As we have demonstrated with the Queensland and South Australian governments, we can do that," Epthorp said.

Another aspect of Computer Protocol's expansion plans would be aggressively to acquire companies with complementary skills, he said. "This will allow us to grow the way we want and at the speed we want, not just by relying on our own manufacturing," said Epthorp.

Computer Protocol's revenues doubled from $A5 million to $A10 million last year, and Epthorp says they will reach $A26 million in 1988.

"Sure, it's fast growth, but we've reached the size now where we can contain it," Epthorp said. "The move east, the equity financing, the increased staff and marketing push, are all part of a definite strategy. We want to get rid of the image that all we do is protocol conversion.

"We have some of the best expertise in the world in vendor-independent networking. We haven't always been as well known as we deserve, but those days are over," he said.

World rights sold in $500,000 deal

SYDNEY — Australian data communications equipment specialist Datacraft has sold the world rights to a new packet-switching link to SNA hosts to Telematics, on whose X.25 gear the software runs.

The $A500,000 deal is the first tangible result from an agreement between the two companies last year to set up a joint Pacific Regional Development Centre at Datacraft's head quarters in Croydon, Victoria. Datacraft distributes the Anglo-American Telematics range of X.25 equipment in Australia. It retains the rights to distribute the new program in its Australasian operating area.

Conversion

The software, developed over the past nine months, provides interworking and conversion facilities between networks based on ISO standards and systems based on IBM's SNA protocols.

According to Datacraft, the $A10,000 software runs on all Telematics gear and makes the packet-switching network based on this appear as a native SNA facility to the IBM or PCM host.

Terminals on the network can also function as X.3/X.28 packet-switched devices or use asynchronous access. An earlier version of the software provided the same kind of SNA connectivity for DEC users, whose terminals could function as 3278-type terminals on the non-DEC network.

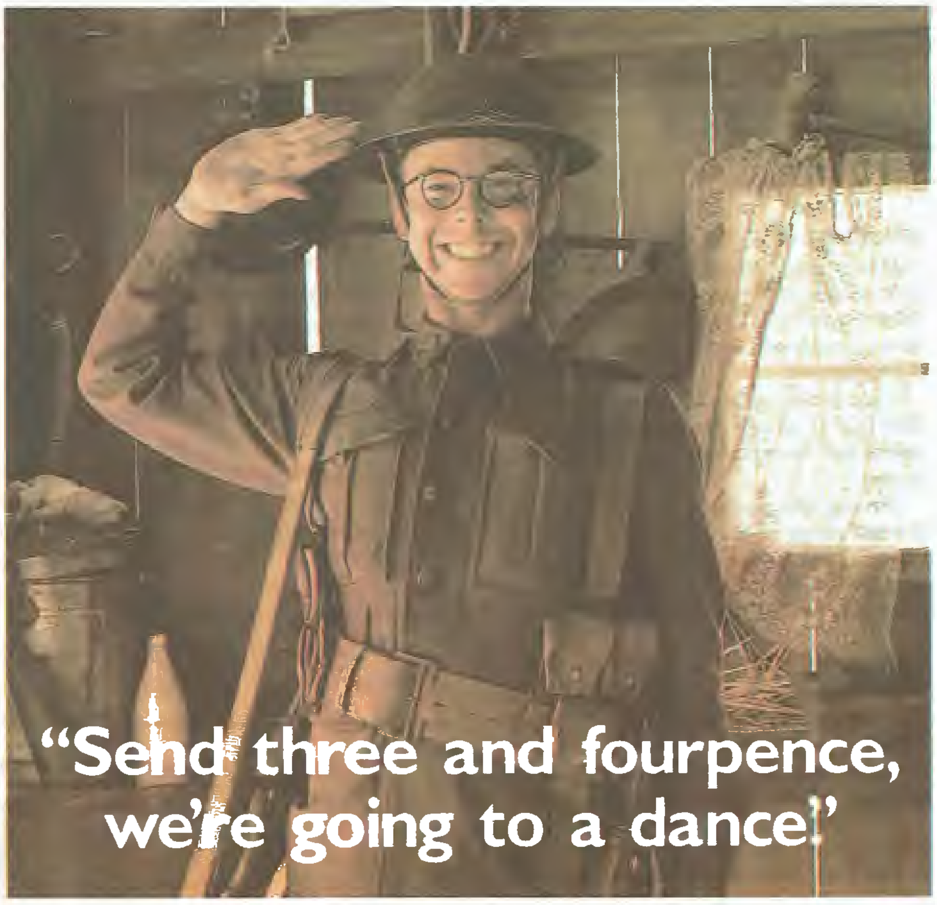
Sliding scales

Datacraft said Telematics would offer the software worldwide as an option. Local pricing would be about $A10,000 per host, with sliding scales for large networks with multiple hosts.

The company said it was developing another IBM connectivity package "for different generations of IBM devices" and is negotiating with Telematics on its distribution.

Datacraft value-added network division manager Paul Lowry said development of the program and its export through Telematics was a major achievement for the company. "It clearly establishes Datacraft as the prominent developer and supplier of packet-switching networks in Australia," he said.

Datacraft earlier this year won a significant two-year contract to supply Hong Kong Telephone subsidiary Datacom with up to 1200 network terminating units (NTUs) and some 35 Tellabs T1 multiplexers. The NTUs will be made by Datacraft in Australia.


"Send three and fourpence, we're going to a dance!"

Ever since man found the need to send messages, the most important part has been the method he has chosen to send them.

Which suggests that in this instance, when the original message was to "send reinforcements, we're going to advance," the choice of a somewhat over-zealous despatch runner was definitely the wrong one.

TAT 2892/L

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Slow-growing Sequoia triples transactions

By James Connolly

MARLBORO, Mass — Sequoia Systems, off to a slow start in the transaction processing market, has returned to the fray with a second-generation fault-tolerant multiprocessor system which it claims beats competitors Tandem and Stratus on price and performance.

The company said its new Series 200 online transaction processing system provides three times the transaction throughput of the Series 100, which was announced in 1984 and was delivered to the first of only 12 customers last year.

Sequoia said a six-processor Series 200 runs at 83 transactions/sec on the ET1 Debit-Credit benchmark, compared with 26 transactions/sec for a slightly more expensive Tandem VLX and 50 transactions/sec for a less expensive Stratus XA2000. Based on those figures, Sequoia claimed a cost-per-transaction of $US11,200, compared with $US36,000 for Tandem and $US16,600 for Stratus.

"We're a long way down the road now, because we have key reference accounts," said Sequoia president William Grover of the difference between the company's 1984 announcement and that of today. Sequoia said Series 200 systems, based on Motorola's 20MHz 60820 rather than the 10MHz 60810 of the Series 100, are already installed at several customer sites.

Like the Series 100, the Series 200 runs Sequoia's Topix operating system, claimed to be compatible with AT&T's Unix System V, BSD Unix 4.3 and Pick Systems' Pick Open Architecture.

An IDC analyst briefed by Sequoia said the company needs to sell 10 or 20 more systems to attain market credibility. "Credibility is the whole thing," said analyst David Moschella. "At least a half-dozen companies have failed trying to do what they want to do."

Moschella said Sequoia has recognised that it and other companies erred in the past by trying to port Unix directly to an OLTP system. He said Sequoia has corrected that by building its system around a Unix kernel.

Grover claimed Sequoia holds advantages over Stratus and Tandem in that Sequoia's multiprocessor architecture has more room to grow incrementally with the addition of more processors or the substitution of a faster chip.

Under that architecture, two microprocessors in each processing element perform the same task and compare results. If those results differ, the processing element is shut down and the task is returned to a queue ready to be redone by another processing element.

A Series 200 with six processing elements, 64M-bytes of memory, two I/O processors, 13 disk drives and system software costs $US929,000.

- *James Connolly writes for US Computerworld.*

TSR program for simple serial ties

MELBOURNE — Interrupt Systems has developed a hardware/software system that lets users link up to four personal computers via their serial ports for simple file transfers, remote disk access, printer sharing and messaging. The $A995 inc tax price includes a memory-resident program that operates transfers at 19.2K-bit/sec in background mode. It is said to offer full error-detection and recovery protocols and be ideally suited for small-workgroup word-processing requirements.

Interrupt Systems (Australia) Pty Ltd: (03) 232-9817.

System Solutions directors Ivor Livingston and Debra Asciak attend to the demise of the Telecom telex machine: Their Telexlink/36 interface for IBM minis makes it possible.

Telexlink now for IBM/36 users

SYDNEY — System Solutions has released Telexlink/36, a locally made hardware and software package designed to let IBM System/36 users send and receive telex messages. Telexlink/36 consists of a series of RPG programs, a communications controller and a telex interface authorised by Telecom to be connected to the network without the need for a standby telex machine. The controller links the /36 CPU as a 5250 device. The package supports multiple lines, leased telegraph connections and switching between leased and public lines. A Group 3 facsimile interface, Faxlink, will be added later.

All standard telex facilities including broadcast are available, plus alternative number dialling, retries, abbreviated dialling, priority sending and time delay sending.

System Solutions Pty Ltd: (02) 29 2222.

10M-bit/sec twisted-pair picks up momentum

CAMBRIDGE, Mass — Announcements of actual or planned 10M-bit/sec Ethernets running over ordinary telephone wire continue to roll in amid preparations for an IEEE plenary meeting this month that will deliberate on whether a new standard is really needed.

At a preparatory session of the IEEE's 10Base-T study group hosted by Micom-Interlan, attendees discussed criteria for presentation to the full meeting. Micom-Interlan, a supporter of the technology, said it is reviewing development options. "We are anxious to incorporate the data from the work group meeting and will be announcing our specific product plans within the next 30 days," it said in a prepared statement.

Ungermann-Bass beat Micom to the punch when it joined the growing list of vendors to unveil a 10M bit/sec Ethernet that runs over unshielded telephone wire.

The networking vendor also announced a joint development agreement with Hewlett-Packard to ensure inter-operability between the two companies' twisted-pair products.

Ungermann-Bass's network will incorporate technology designed to eliminate the cross talk and outside interference that tends to plague high-speed twisted-pair networks over longer distances, the company said.

As a result, the network will support 10M-bit/sec data rates over unshielded twisted-pair connections of up to between the workstation and wiring hub.

Scheduled for initial availability during the first quarter of 1988, the network will comply with IEEE 802.3 standards, Ungermann-Bass said. Currently, HP, 3Com, Synoptics and DEC have announced fast Ethernets over unshielded twisted-pair. Some discussion at the 10Base-T meeting revolved around the estimated size of the market, as well as the need for standards. Although Micom contended that Fortune 1000 companies are demanding 10M-bit/sec performance of Ethernet without having to run expensive coaxial cable, 3Com is predicting a small market.

"A very small fraction of total system revenue (much less than 5 per cent of networking revenue alone) will flow from twisted-pair devices themselves," said Robert Metcalfe, 3Com's senior vice-president of technology.

In addition, Metcalfe suggested that twisted-pair Ethernet standards may not be necessary for three reasons, including the size of the installed base of twisted-pair, its variability and 3Com estimates that relatively few dollars will be spent on the twisted-pair transmission devices themselves.

"It is questionable in our minds whether Ethernet standards are needed for twisted-pair wiring," Metcalfe said.

"If they are, we suggest that such standards not conflict with existing Ethernet standards and that they focus on the co-existence of Ethernet and other services, including especially voice, in existing telephone cables.

And with the ever-accelerating expansion of technology, there's an increasing number of options to choose from.

Which can cause confusion when you're trying to decide which product best suits your particular business needs.

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Like despatch runners, messages come in all shapes and sizes. From the short, urgent one-off message that advises head office that your flight has been delayed. To an inventory system ordering urgent stock replenishment.

In all cases, the accuracy, speed and even the ability to directly integrate with your office computer system can have significant impact on your business productivity.

The message is, of course, that it all adds up to making or losing money.

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Success in business is invariably related to productivity. So if you want to improve yours, you'll need all the ammunition you can lay your hands on. And knowing about all the options available for sending text messages should be an essential part of your battle plan.

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TAT 2892/R

New Products: HARDWARE

Clearway serves as local area net

SYDNEY — Computer Network Systems has announced Australian availability of the Clearway switched networking system based on a serial-to-ring protocol conversion node powered by a Z80 processor. The Clearway system lets users daisy-chain any devices that have RS232C ports into a ring configuration, using one node for each device connected. The $A760 node converts the serial data stream into packets that are addressed to specific other nodes. All exchanges are said to be transparent to the user, with the system acting as if pairs of devices were hard-wired together. CNS also announced local availability of QNX, a multitasking, multi-user operating system from Quantum Software Systems.

Computer Network Systems Pty Ltd: (02) 419 7177.

Lan products use encryption

SYDNEY — Network Solutions has introduced the first two of a series of secure local area network products using data encryption and access monitoring.

Based on the US Defence Department's transmission control protocol/internet protocol (TCP/IP) specifications, both the Secure CS/50 communications server and the Secure NCS/AT network control station are aimed at organisations with confidential databases.

The Secure CS/50 supports two asynchronous devices or host ports. The Secure NCS/AT is an AT-compatible Xenix box providing centralised network control and monitoring of Lan-attached devices. Both come with either standard Ethernet interface, Bridge 5M-bit/sec broadband interface or "thin" Ethernet interface.

They can communicate in a non-secure mode with any TCP/IP node, permitting selective use of "open" and/or "secure" data paths, depending on use requirements and authorisations.

Both DES encryption of data and public key encryption of net management and audit trail information, including session key interchange, are used to enhance the security of the system. The CS/50 is also available in a non-secure version for factory or campus installation. Both the secure and open CS/50 have an embedded "thin" Ethernet interface.

Network Solutions general manager Richard Freemantle said security concerns has mounted with the "proliferation of effective network analysis tools, such a Network General's Sniffer, which let outsiders tap in and monitor data on the network."

DEC terminal server aimed at large sites

MAYNARD, Mass — A new high-end terminal server from Digital Equipment Corp plugs up to 128 asynchronous devices into a standard Ethernet local-area network. The Decserver 500 is aimed at customer sites with large numbers of terminals linked to computer systems through a central wiring closet, according to DEC, which also announced a Single Port Ethernet Repeater, DESPR, that provides a low-cost, single-line thin-wire Ethernet connection from the desktop to an Ethernet backbone.

The new server offers the same multiple-session support, load balancing, status and performance monitoring and intraserver communications found in the Decserver 200, but at lower cost per user. The new terminal server is completely compatible with both the DECserver 100 and 200 devices.

Buyers can mix multiple line cards in the same cabinet: Up to eight optional cards, either 16-line Dec-423 (for the Decconnect wiring scheme) or eight-line RS232C cards, can be slotted into the server. The Decserver 200 takes a set of one the other, but not both.

DEC plans to add other interfaces for other terminal types in the future, but the company declined to be more specific.

PRIVATE NETWORKS

— can they survive?

Core Report December 1987

After looking at the offerings promised to pour forth from the ISDN horn-of-plenty in a recent issue of *Communications World,* private network users may require some reassurance that the world is not going to end for them. They need not fear: ISDN will, if anything, increase the opportunities for private networks to flourish. According to some industry observers, hybrid networks relaying in part on the publis ISDN backbone will provide an attractive alternative to full ISDN carrier services for some companies, or at least an easy migration path for current users of Megalink-based voice/data networks.

Packet-switching networks, at present the other connection of choice for private netbuilders, will also thrive, with some large users in overseas trials reporting a number of benefits in linking X.25 nets via ISDN pipes. These benefits include shorter sessions in terminal-host applications, allowing more terminals to share frontend processor access, as well as the inherent security of packet-switching technology and the ability to do previse "user-pays" accounting for mainframe usage.

Communications World's Core Report in December also plans to look at satellite and microwave-based private networks. Editorial submissions on any of these topics are welcome. Please contact the editor, **Luis M. Huesch**, on **(02) 439 5133** or **(02) 960 3710** for details.

Please note also that DESKTOP COMMUNICATIONS, our regular feature on PC Connectivity/Networking, is always open for contributions from interested parties. The same goes for our new regular page/s devoted to NETWORK MANAGEMENT.

For advertising queries please talk to **Terry Swan**, the national sales manager for *Communications World* on (02) 439 5133.

COMMUNICATIONS WORLD

Booking deadline 6th November.
Material deadline 13th November.

IBM's new Rolm PABX

(Continued from page 2)

Data Communications Module, which provides expanded data-handling capabilities to any station supported by the new 16-channel voice and data line interface.

IBM said customers who installed CBX IIs after December 31, 1986 will be eligible for an upgrade incentive, a 20 per cent credit toward an 9751 CBX installed before 1990.

New switch features announced with the 9751 can also serve as enhancements for current CBXs. They include improved automatic call distribution (ACD) software and a new attendant station.

IBM's Netview/PC Rolm Alert Monitor has been extended to cover the new switch as well as Rolm's low-end PABX, the Redwood. The ACD enhancement, the IBM Call Centre Resource Manager, provides the ability to oversee system performance and control operating expenses.

IBM said a new release of Netview/PC Rolm Alert Monitor, Version 1.2, can be used to poll up to 20 CBXs to collect error and alarm data. The Alert Monitor displays alerts on Netview/PC for local systems management and on a centralised host-based Netview system for centralised network control.

Amiel Kornel reports from Paris that the "Europeanised" version of the switch — IBM's first digital PABX to be marketed in Europe — will be manufactured by IBM's purpose-built Integrated Services Switching System (ISSS) unit in the UK.

He said IBM sought to underscore its commitment to Integrated Services Digital Network (ISDN) technology, announcing that the 8750's 295M-bit/sec Rolmbus 295 should enable the system to offer users "ISDN-like" features.

The company also noted that it had taken part in ISDN field trials in Belgium and the UK, and that it plans to use the 8750 in further ISDN field trials next year in West Germany and Norway.

Test gear has extra capabilities

A number of new pieces of network test equipment has come on to the market recently. And while not everything is up to the tricks one could get up to with Network General's The Sniffer (*Communications World*, August issue) — said to be a favorite of sophisticated hackers — some of the new generation of compact disk-based test gear is capable of powerful monitoring and simulation rather than mere testing. We have looked a little more closely at some recent releases, and come up with this selection:

IBM readies Lan analysis tools

RYE BROOK, New York — Entering the Lan analysis field, IBM has announced a PS/2-based tool that allows users to measure use and activity on token ring Lans.

The IBM Token Ring Network Trace and Performance Tool operates with the PS/2 Model 50 and higher models or PC/ATs. It consists of menu-driven software and one of two adapter cards to connect the personal computer to the Lan. The product can analyse a Lan of up to 260 devices. It does not work with Netview, IBM's network management program, a spokesman said.

The two adapter cards are the IBM Token Ring Network Trace and Performance PC Adapter II for the PC and the IBM Token Ring Network Trace and Performance Adapter/A for the PS/2. The Adapter II costs $US1295, while the Adapter/A costs $US1195. The software costs $US295. All three products will be available in the first quarter of next year. Local availability and pricing were not immediately announced.

Fibre users see the light

SYDNEY — Philips scientific and industrial division offers a modular combination of optical power source and optical power meter, the OPS-10 and OPM-10, designed for high-precision attenuation measurements of optical fibre cables. The power source can be equipped with LEDs or laser diodes and is claimed to be highly stable in both indoor and outdoor use.

Philips: (02) 888 8222.

Data laptop packs punch

The DA-15 data analyser with LCD screen.

MELBOURNE — West German test gear specialist Wandel & Goltermann has released a lap-top size data analyser with LCD screen and full Ascii keyboard for troubleshooting V.24, V.35 or X.21 interfaces, monitoring data lines and testing and simulating communications protocols. The DA-15 can analyse data streams of up to 72K-bit/sec and make Bert/Blert measurements at up to 64K-bit/sec, simulating either DTE or DCE. Programming is via soft keys and up to 64K-byte of non-volatile memory holds setup parameters and test data for up to five years. Output can be directed to a parallel printer. Optional modules are available for SNA, X.25 and DDCMP protocol interpretation. The unit is powered by a six-hour continuous use nickel cadmium battery and weighs 1.5kg.

Wandel & Goltermann Pty Ltd: (03) 267-8699.

Luggable packet protocol tester

SYDNEY — Electro Optics has announced availability of the Japanese-made Ola-721 protocol analyser, a smart device that switches to monitor mode automatically to display the relevant information when testing unknown protocols or transmission speeds. The unit comes with builtin 3½in floppy drive that reportedly can store full duplex data at 19.2k-bit/sec in real time. The analyser handles X.25, SNA HDLC (NRZ/NRZI), SDLC (NRZ/NRZI), bisynch, asynch and transparent protocols and can display realtime memnonic interpretations of HDLC control fields and X.25 packet headers. Simulations can be performed, either via keyboard entry (BSC control, numeric and alpha characters) or by means of a custom Basic program. Pattern checks can be made, including error rate measurements as per CCITT 51 pseudo-random numbers generation. Menus, programs and data can be uploaded or downloaded through the unit's serial port.

Electro Optics Pty Ltd: (02) 654-1873.

Lan sniffer can simulate, too

The HP 4972 Lan protocol analyser can be used to identify network problem.

MELBOURNE — Hewlett-Packard Australia has introduced series of disk-base protocol analysers, the latest release being the HP 4954A communications tester for use on both wide area and local area networks. Flexible software lets the network manager or developer tailor its use to X.25 performance analysis, or us it as an SNA, X.21 or CCITT Channel Seven development tool. Another portable local area network analyser, the HP 4972A, is designed to monitor, capture and analyse data from 802.3-compatible Ethernet Lans. Users can create and measure network loading and analyse performance at the network, node and connection level. With the information derived, network managers can tailor networks for optimal performance. Softkey programming can be used to filter out irrelevant data, capturing only meaningful events as they occur. Equipment designers can use the analyser's traffic generator to create stress scenarios and test under extreme network load. Testing menus are automatic and sequences can be run over days weeks or months.

Hewlett-Packard Australia Limited: (008) 033-821.

Package makes PC the test centre

SYDNEY — Information Network Systems has released a PC-based protocol analyser said to be a lowcost alternative to expensive dedicated data communication testers. The LM1 Line Monitor/Protocol Analyser, an addon board and software package from US vendor PCI, is the first in a planned series of such product designed for PC use. It is said to handle HDLC, SDLC, SDLC (NRZI), ISDN asynchronous and bi-synchronous protocols. Optional modules add X.25, SNA, DDCM and ISDN Level 3 (Q931) decoding capabilities. Data can be trapped in memory at up to 72K-bit/sec if used on an AT-class machine, with full duplex recording to disk at 9.6K-bit/sec. DTE/DCE emulation includes clock signals for synchronous lines. Parity checking, framing and CRC are performed, Ascii, EBCDIC character sets as well as hex and octal formats are preset; others, such as Ipars, can be defined by the user. The LM1 software is menu-driven. Displays use EGA/Hercules hi-res capabilities. A V.35 interface is optional for DDS data trapping.

INS Pty Ltd: (02) 411-3268

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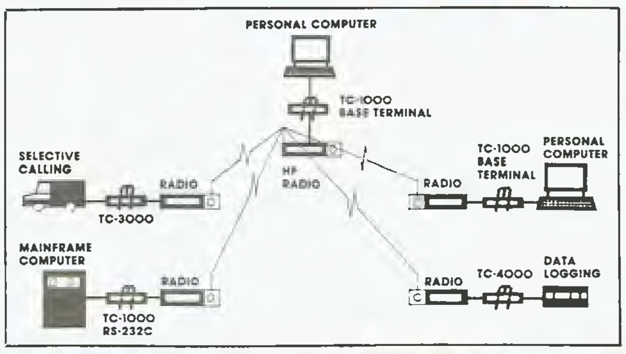

Features include:
- ★ Compatibility with HF-SSB. VHF and UHF radio.
- ★ Transmission of the ASCII character set.
- ★ Totally private.
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THE COMMUNICATION ALTERNATIVE

TRANSCOM AUSTRALIA LTD

Unit 2/30 Walters Drive
Osborne Park 6017
PO Box 714, West Perth 6005
Telephone PERTH (09) 244 1166
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PRODUCT UPDATE ON

TERMINAL turmoil is upon us: IBM has rediscovered the Ascii market and everyone else from DEC to HP is scrambling for a piece of the action. In the process, small players risk getting squeezed out of the picture. In turn, terminal specialists such as Wyse — which hopes to capture a quarter of the local market — continue

Badge	Model	Emulate	N-V Ram	Display Ram	Interface	Control	Modes	Format	Speed	Buffer	Aux port	Screen	Refresh	Display
HEWLETT-PACKARD	HP 700/22	VT2		4 pages	RS232C									
	HP 700/41	WY-30, TV905, 910, 925, ADM, Haz, ADD, Qume		1pg	RS2									
	HP 700/71	PC3191, PC3270			3270									
	HP 700/92	HP2392A, VT2		8pg	RS2, HP422									
	HP 700/94	HP2394A, MODC, VT2		16pg	RS232C, 422									
KIMTRON (Datatel)	KT-5	ADM, VT52, TV, HAZ, ADDS, +	512	2/1pg	RS2	DTR, X	fh, ch, blk	dps	19.2	4K	RS2	14g/a		1s/e
	KT-70	VT100, TV, DG, PT25, T1931÷	512	1pg	RS2	DTR, X	fh, ch, blk	dps	19.2	4K	RS2	14g/a		1s
	KT-70/PC	VT100, TV, DG, PT125, IBM PC	512	1pg	RS2	DTR, X	fh, ch, blk	dps	19.2	4K	RS2	14g/a		1s
	KT-22	VT2, X	512	3/2pg	RS2	DTR, X	fd	dps	19.2	4K	RS2	14g/a		1s/e
	KT-22/PC	VT2, X	512	3/2pg	RS2	DTR, X	fd	dps	19.2	4K	RS2	14g/a		1s/e
	Satellite	IBM PC	—	640K	RS2, K-net	IBM PC	fh, ch, blk	dps	1Mhz	2K	RS2, pp	12g/a, 13rgb		1s/e
OLIVETTI	WS225	NY50, Televideo 925, 910, Lear Siegler, ADM3A, ADMS, ADDS Vietpoint, A1, A2, 60	320	2pg	RS232C	DTR/X	fd, hd, loc, char, mom	dps	38.4		RS232C	14g/a	60	1s/e
	WS220	DEC VT220, VT100, VT52-user select	400	2pg	RS232C/RS423	DTR/X	fd, hd, loc, char, mom	dps	38.4		RS2/RS423	14g/a	60	1s/e
	WS280	Ascii, Ansi and PC term	400	6pg	RS2	DTR/X	fd, hd, loc, char, mom	dps	38.4		RS2, PP Centronics	14g/a/w	60	1s/e
REBUS 14" (CVA)	GDT-6160 A	TV, DEC, WY, HAZ, ADDS, ADM	Bk	16K x 16 bits, 4pg	RS232C, RS422, 20 mali	—	fc, hd, duplex, blk, lt	7/8 dps	19.2/38.4	—	Asynch, Bi-dir	14g/a/pw	50, 60, 75	
TATUNG 14" (CVA)	7261A	TV, LSI, ADDS, Haz, IBM, WY, DEC	—	4pg	RS232C/RS422, 20 mali	—	blk, lt	26 x 80/132	19.2/38.4	—		14g/a	50, 60	
TECO (TCG)	VA220	DEC VT52, VT100, VT200	Yes	—	RS2		—		—	—	RS232C	14g	—	
	VA3178	IBM 3278, 3178, 3191	—	—	IBM 3270, 3274/6, S/370, S/30xx 43xx			—	—	—	—	14g	—	1s
TELEVIDEO (Data Peripherals)	TV905	910, 910 + 925 Haz, ADM 3A/S Regent, ADDS Viewpoint AZ 1410/1500, Qume 101 25	Yes	Yes	RS232 20MA, RS 422	DTR 8	loc, mon, blk, fdx, mdx	dps	19.2	Yes	Print	14G/A		—
	TV955	950, 955		4 pages	RS232, 20MA, RS422	DTR 8	loc, mon, blk, fdx, mdx	dps	38.4	Yes	Print	14G/A		—
	TV9550	ADM 31, TV1 910 +, 920 925 Haz 1500, ADDS Viewpoint AZ	Yes	4 pages	RS232, 20MA	DTR 8	loc, mon, blk, fdx, mdx	dps	38.4	Yes	Print	14G/A	—	—
	TV9220	DEC VT52 VT100 VT220	Yes	—	RS432, 20MA, RS422	DTR 8	loc, mon, blk, fdx, mdx	dps	38.4	Yes	Print	16G/A	—	—
	TV965	950/955, WY 50, 504, 60 ADD Viewpoint AZ 60, Haz 1500, IBM 3101, TV 910/910 +, 912/920, 925/925E, Lear Siegler ADM3A, 5, 31, IBM 3161, 3162 DEC VT100, PC D200, PC/AT	Yes	7 pages	RS232, 20MA, RS422	DTR 8	loc, mon, blk, fdx, mdx	dps	38.4	Yes	Print	14W/G	—	—
	TV PT100	DEX VT52, VT100	Yes	—	RS232, 20MA	DTR 8	loc, mon, blk, fdx, mdx	dps	38.4	Yes	Print	9 yellow	—	—
	TV 955GT	Tek 955, 4010/4014 Plot 10	Yes	4 pages	RS232, 20MA	DTR 8	loc, mon, blk, fdx, mdx	dps	38.4	Yes	Print	14A/G	—	—
	TV 9220GT	Tek 9220, 4010/4014 Plot 10	Yes	—	RS232, 20MA	DTR 8	loc, mon, blk, fdx, mdx	dps	38.4	Yes	Print	14A/G	—	—
	TV PC STATION	IBM PC, Kimtron KT-7/PC Link PC/Term, TV1 905/925	Yes	2 pages	RS232, Parapall printer 20MA	DTR 8	loc, mon, blk, fdx, mdx	dps	38.4	Yes	2 Print 2 Coms	14A/G	—	—
UNISYS	SVT 1220	VT52, VT100, VT200	2048		RS2	X, DTR	char, bl, fd, hd	dps	19.2	Yes	SP RS2, fd, hd, buff	12G		s/e
	SVT 1210	VT52, VT100			RS2	X	char	7p	19.2		RS2	12G		s/e
VISUAL (Kenelec P/L)	Visual 602	VT100, ADM31, WY50, TV, ADDS, Haz, Tek 4010/4014	Yes	Yes	Asyn RS422/423/232	DTR, X	fd, hd, loc	dsp	3 38.4Kb	Yes	SP, buff	14fg	70	1s/e
	Visual 603	VT100, VT200, VT52, Tek 4010/4014	Yes	Yes	Asyn RS422/423/232	DTR, X	fd, loc	dsp	5 38.4Kb	Yes	SP, buff	14fg	70	1s/e
	Visual 604	ADM31, WY50, TV, ADDS, Haz, Tek 4010/4014 IBM PC Keyboard Scan code and screen	Yes	Yes	Asyn RS422/232	DTR, X	fd, hd, loc	dsp	5 38.4Kb	Yes	SP, buff	14fg	70	1s/e
	Visual 630	VT 200, VT100, VT52, Tek 4010/4014	Yes	Yes	Asyn RS422/423/232	DTR, X	fd, loc	dsp	S 38.4Kb	Yes	SP, buff	14fg	70	1s/e
	Visual 240	VT240, VT220, VT100, VT52, Regis Tek 4010/4014	Yes	Yes	Asyn RS232/CCITTV24	X	fd, loc	dsp	S 19.2Kb	Yes	buff	14g	60	5 + s/e
	Visual 241	VT240, VT220, VT100, VT52, Regis Tek 4010/4014, Tek 4015 color	Yes	Yes	Asyn RS230C/CCITTV24	X	fd, loc	dsp	S 19.2Kb	Yes	buff	14rgb	60	5 + s/e
WYSE (Imagineering/MPA)	WY-30	WY, ADDS, ADM, TV, LS			RS2		fd, hd, blk, hdblk	ds	38.4		RS2	14ga		2s
	WY-50	WY, ADDS, ADM, TV, Haz			RS2		fd, hd, blk, char	ds	38.4		RS2	14ga		2s/e
	WY-60	WY, VT1, DG, LS, TV, ADDS, IBM 3101, Haz		7 pages	RS2		fd, hd, blk	ds	38.4		RS2	14gaw	60	2s/e
	WY-75	VT1, X	Yes		RS2		fd, hd, blk, char	ds	38.4		RS2	14g		2s/e
	WY-85	VT2	Yes		RS2/20		fd, hd, blk, char, loc	dsp	38.4		RS2	14ga		1s/e
	WY-99GT	Tek, PC, HGA, CGA, WY, X, VT2, TV, ADDS, Haz, Ls	Yes	1p graphics, 2p 24*132	RS2/42		fd, hd, blk, char, loc, mon	dsp	38.4		RS2	14a	60 or 70	1s/e, pg
	WY-350	WY, ADM, TV, ADDS, Haz	Yes		RS2		fd, hd, blk, char	dsp	38.4		RS2	14rgb		2s/e
ZENTEC (Datatel)	8392	HP2392A	4K	16K	RS2, 422	X, DTR, RTS	fh, ch, blk	dps	19.2	128	RS2, 422	14ga	60	2s/e
	ZEPHYR 220	DEC 220/100/52	2K	4K	RS2, 423, 20	X	fh, ch, blk	dps	19.2	128	RS2	14ga	60	1s/e

Emulation: *ADD = ADDS Viewpoint and Regent; ADM = Lear Siegler; Amp = Ampex; Bee = Beehive; DG = usually DG200/210; Esp = Esprit (usually 6310); ET = Burroughs; Free = Freedom (Liberty); Hars = Harris; Haz = Hazeltine (usually 1400/10, 1500); HP = Hewlet-Packard; ICL = ICL CO1/3; InC = Intercolor; InT = Intertechnique; nat = native mode; PC = IBM PC; Perk = Perkin-Elmer, Rex = Rexon; Strat = Stratus; tek = tekronix; TTY = teletype; TV = Televideo; VT1 = VT100 52; VT2 = VT100/52/220; Vac = Univac; video = videotex capability; VIP = Honeywell; WY = Wyse WY-50/50+; X = ANSI X3.64.* **Displays Ram** *(number of bytes or pages of display memory).* **Interface** *(serial interface standard or operating environment); RS2 = RS232C or V.24; /42x = additional RS422 or 423; 20 = 20mA current loop; 3270 = IBM 3270 environments; 32xx = IBM 3274/76 controllers; s/a = sync/async protocols; S/43 = IBM S/43xx display/printer adapter; twin = twinax:IBM S/38 environment; opt = wide range of options.* **Control** *(hardware or software hand-shaking): DTR = Data Terminal Ready; X = X-on/X-off; RTS = Request To Send.* **Modes** *(available communications modes; local echo is assumed; local mode is off-line); fd = full duplex; hd = half duplex; fh = full and half duplex; loc = local mode; ch/char = character/conversational mode; bi = block transfer; line or page modes; mod = modem control; mom = monitor mode (displays control characters).* **Format** *(serial data format variables); d = data word length; s = number of stop bit; p = parity.* **Speed** *(Maximum available data transfer rate in K-bits/sec; s = split data rates supported (eg. 1200/75).* **Buffer** *(communications buffer memory size in bytes).* **Auxiliary port** *(auxiliary port facilities, in general, same as main interface); sp = serial printer port; pp = parallel printer port: buff = buffered.* **Screen:** *xx = diagonal size in inches; g = green; a = amber optional; w = paper white optional; rgb = color; f = flat; mono = monochrome; LCD = Liquid Crystal Display.* **Refresh** *(maximum available screen refresh rate in Hertz).* **Display:** *s = standard (24 lines x 80 characters — preceding number give status lines, + indicating extra lines); /e = optional expanded (x 132 characters): xx = number of lines where not standard; pg = variable page length autopaging or multiple display formats other than the types mentioned.* **Matrix** *(character pixel matrix on cell size — description uses alphanumeric code; a = 10 to k = 19, excluding 1): 89:ab = 8 x 9 character on 10 x 11 cell; figures after slash / denote matrix sizes in 132 column mode.* **Character** *sets (available character sets, UK assumed: EBCDIC = Expanded Binary Coded Decimal Interchange Code (256 characters); prog = programmable (down-loaded) character set;*

TERMINALS

to diversify into the PC arena. Below is the second part of our selection of terminals. The chart was compiled on the basis of information provided by the terminal suppliers. All care was taken in assembling the chart, but intending purchasers should check all details with prospective vendors.

Matrix	Char. set	Language	Attributes	Cursor	Scroll	Keyboard	Function	Key pads	Special	Price $ (excl. sale tax)	Remarks
79:ac/5a:6c	128 Ascii	int	full, sec	bubb	jmp	ANSCII	84p	NC	CRT	- 760	Programmable features
79:9d	128A Sg, sgm, lg	int	full, n/b, sec	bubb	jmp	ANSCII	84p	NC	CRT	875	Programmable by Datatel
79:9d	128A, IBM PC	IBM PC	full, n/b, sec	bubb	jmp	IBM PC	84p	NC	CRT	919	Behaves like IBM PC
7a:aa/7a:9a	Ascii, prog, sg	int	full	bubb	s/j	VT	13/30 pnv	NCE	CRT	889	Enhanced DEC emulator
7a:aa/7a:9a	Ascii, prog, sg	IBM PC	full	bubb	s/j	IBM PC+	15/30pnv	NCE	CRT	962	Enhanced IBM PC compatible VDU
7g:9d	IBM PC	IBM PC	IBM PC	bubb	s/j	IBM PC	15p	NpCE	CRT	1224	Network IBM PC compatible
8 x 13	256 Ascii	int opt	full sec	bub	s/j, VS	Ascii qwerty	16/32/pnv. 4/8 pc	Np, E C	CRT		Ascii terminal capable of interfacing with variety of computer systems
8 x 13	128 A. Sg		full sec non	bub	s/j, VS	VT	38pnv	Np	CRT		ANSI/DEC VT220 compatible
8 x 13	256 IBM, 512 prog	12	full sec b/non	bub	s/j, VS	Ascii, PC/AT, RT/PC	32pnv	Np	CRT		Two host sessions, 3 in 1 terminal, PC parallel printer port, choice of 3 keyboards
7 x 13	95 Asch. 37 EC. 32 DECG 32 WYG	int	p/up (Ascii)	bub	VS	111, 115	46p	E/N/F (3)	CRT		4010/4014 option
7 x 13	128 Ascii, 46 EC, 48 SG	int	p/up (Ascii)	bub		Ascii 102, prog	24p	—	CRT	—	—
7 x 9	Ascii	—	part	bubb	smt/jmp	105	36pf			1400	Many more advantageous options than VT220
79:9k	Ascii	—	part	bubb	—	88	24pf			1400	VA3178 has volume control for the audible alarm
79:9	ASCII	int	full	4 types	2 modes	III	32	Yes	—	—	—
79:9	ASCII	int	full	4 types	4 modes	III	64	Yes	—	—	—
79:9	ASCII	int	full	4 types	4 modes	III	64	Yes	—	—	—
79:9	VT220	int	full	4 types	3 modes	DEC	30	Yes	—	—	—
79.9	ASCII. ANSI, PC/AT	int	full	4 types	4 modes	DEC, PC/AT. Ascii	128	Yes	—	—	—
57:7	VT100	int	full	4 types	1 mode	vt100	14	Yes	—	—	—
79:9	ASCII, TEKTRONIK	int	full	4 types	4 modes	III	64	Yes	—	—	—
79:9	ANSI VT220/TEKTRONIK	int	full	4 types	4 modes	III	30	Yes	—	—	—
79:9	ASCII/PC/AT	int	full	4 types	2 modes	PC/AT	14	Yes	—	—	—
79:AA	ASCII, DSG, NR	15		bubb	Suit, jmp, vs	vt	25+15p	Yes	CRT	1195	Suits Unisys Unix systems
79:AA	ASCII. DSG			ub		vt1	4p	Yes	CRT	847	
1114:dg/614:8e	A		db1, full, dim	bub	s/j vs	103 vt	15/30 NV	18N. 30NV, 11E	rtc, dta, crt, graph, calc, pans, nvans, calender	1285	TEK 4010/14 graphics standard
1114:dg/712:8k	A		db1, full, dim	bub	s/j vs	103 vt	15/30 NV	18N, 30NV 11E	rtc, dta, crt, graph, calc, pans, avans, calender	1285	TEK 4010/14 graphics standard
1114:dg/614:8e	A		db1, full, dim	bub	s/j vs	103 vt	15/30NV	18N, 30NV, 11E	rtc, dta. crt, graph, calc, pans, nvans, calender	1350	TEK 4010/14 graphics standard
1114:dg/614:8e	A		db1, full, dim	bub	s/j vs	103 vt	15/30NV	18N, 30NV, 11E	rtc, dta. crt, graph, calc, pans, nvans, calender	2150	TEK 4010/14 graphics standard
810:99/510:6a	5		db1, full, dim	bub	s/j vs	106 vt	15/15NV	18N, 20 Function 11E	crt. nvans, graph	2850	
810:99/510:6a	5		db1, full, dim	bub	s/j Vs	106 vt	15/15NV	18N, 20 function 11E	crt. nvans, graph	3670	
79:ac	128A. sg	11	full, sec	bub	smt, vs, spt	83, lo-pro	16/41p	NEC			Entry-level ASCII terminal/tilt swivel. height adjustable arn
7a:ad	128A. sg, lg	11	full	bub	smt, spt	101, lo-pro	32/32p	NEC			Best selling ASCII terminal/tilt swivel, height adjustable arm soft setup
7c:ag	512 prog	11	full, sec, row, dbl	bubb	smt, spt, vs (forw/rev)	5 choices Ascii, Ansi, PC, AT, PC316X	variable	NEC	rtc, dtu, word, calc		Tilt swivel height adjustable arm
7c:ad	128A, sg, lg	11	full, dbl	bub	smt, spt	101, lo-pro	16/16p	NEC	rtc, dtu, word, calc		DEC or Unix compatible terminal
79:aa	255A. sg, lg, prog	8	full, dbl	bubb		105. lo-pro	15/30p, nv	NEC			VT220 full emulation
7c:ad	255A, sg, lg, prog	8	full, dbl	bubb	smt, vs, spt	3 choices, Ascii, VT220. PC Enhanced	variable, nv	NEC	ans, rtc, calc, cal, Ascii tbl. CRT. graph		PC graphics and mouse
7a:ad	128A, lg	11	full	bub	smt, vs, spt	101, lo-pro	16/32p	NEC			Full color palette
76:ae	Ascii, HP. sg	HP	HP	bubb	s/j	HP2392	8p/10pf	18NP. C, E	CRT	1911	Enhanced HP 2392A emulator
79:9a	Ascii, sg, bg, net	int	full	bubb	s/j	105 DEC	15p/pf	18NP. C, E	CRT	1115	Ennanced DEC VT220 emulator

2xp = programmable sets; figure alone denotes numbers of displayable characters; xxxA = ASCII, including control codes unless stated; Dsg = Dec special or supplementary graphics; sg = special graphics; bg = block graphics; lg = line graphics; nat = national character symbols; sym = special symbols; NR = national replacement character set; alt = alternate character set; DNR = Dec national replacement character set; sup = supplemental: **Languages** *(number of international character sets available): Dec = Dec multinational character set; int = international character sets; opt = preselectable set.* **Attributes** *(special display attributes): full = bold, blink, blank, underline, reverse; part = no blank; min = up to 4; strike = strike-through; sec = secure/protocol; col = color; non = non-embedded; n/b = embedded or non-embedded; cond = condensed characters; script = sub or superscript; dbl = double height/width; ital = italic; under = underline.* **Cursor** *(attributes): bubb = block, underline, blink, blank; bub = block, underline, blink or blank; bubr = block, underline, blink, reverse; bbb = block, blank, blink.* **Scroll** *(scroll control models): smt = smooth; jmp = jump/pages; s/j = jump or smooth; vS = variable speeds for number); spt = split screen, scroll regions or windows.* **Keyboard** *(preferred keyboard layout style — does not imply compatibility): total number of keys; vt = Dec VT220 or IBM PC AT) cruciform or inverted T cursor pad, separate numeric pad and function keys); VIP =Honeywell VIP; int = integral (non-detached) keyboard; VT1 = Dec VT100; 3278 = IBM 3278; opt = range of styles available; ANSCII = ASCII/ANSI; IBM/Dec = IBM and Dec functions; lo-pro = low profile; qwerty = typewriter style.* **Function keys** *(number and programmability): number of function keys with shift and control; p = programmable; nv = programmable to non-volatile memory; PF = keys with program function; PA = keys with program access.* **Key pads** *(keypad function, proceding number gives number of keys, other abbreviations as for function keys column): N = numeric keypad; E = specific editing keypad; C = cursor keypad; Com = terminal command keypad.* **Special** *(special features): rtc = real-time clock; dtu = desktop utilities; CRT = CRT saver; help = help windows; PCup = upgrade to PC workstation available; Word = Wordstar command sequences; post = power on self test; diag = diagnostics; graph = graphics mode; calc = calculator mode; pans = programmable answer back; nvans = non-volatile programmable answer back; add = terminal has two addresses, printer has third address; buff = keyboard buffer.* **Price** *(one-off, enduser prices where applicable).*

No IBM licence for Lanmanager

MENLO PARK, California — IBM will not be licensing Microsoft's Lanmanager, nor will it opt for Novell's Netware. Instead, "IBM will have a product in the market," according to Michael Maples, IBM director of software and business evaluation.

Microsoft's Lan Manager, under development with 3Com Corp, is to provide Lan functions to OS/2. Although both companies proclaimed it to be a standard and so license it, its acceptance has been uncertain from the beginning due to the lack of an IBM endorsement.

Maples confirmed that IBM does not plan to have any OS/2 communications products until the Extended Edition, the availability of which is to be announced this quarter.

Although IBM will not be licensing products, Maples did not rule out the possibility that IBM might be developing the Extended Edition with another vendor.

Other vendors, including Novell and Microsoft, will be able to license the Extended Edition, Maples said, putting to rest fears that IBM would have a lock on PS/2 communication. "There is no reason they can't (be compatible) unless they choose not to."

Maples also said that future IBM Lan products would be compatible with existing PC Lan software from IBM. "The various Lan programs are going to have to work together," he said.

Rob Glaser, Microsoft's director of marketing for the network group,refused to comment. "We don't comment on what OEMs of Microsoft may or may not be doing," he said. Mark Calkins, vice-president of marketing for Novell's Netware division, said he expects a major component of the Extended Edition to be Enhanced Connectivity Facilities (ECF), which IBM announced in June 1986.

Although ECF now runs only over 3270 emulation and not the more flexible peer-to-peer communication, ECF will support peer-to-peer in the long run, Calkins said.

Mail-Voice talks to busy executives

SYDNEY — Progeni has announced Mail-Voice, a $A77,000-$A96,500 mainframe program that can "read" messages to executives over the phone from their mainframe by synthesised voice. Mail-Voice is claimed to be the first electronic mail system capable of relaying text to any workstation, and voice to any telephone from a mainframe database. The program was developed by Applied Data Research, whose products are distributed in Australia and New Zealand by Progeni.

Progeni: &02) 412 2159

Memo woos the corporate mail

SYDNEY — Software Distribution International has introduced Memo, a Swedish mainframe-based electronic mail package developed by Volvo and L M Ericsson joint venture, Verimation AB. A native Vtam application, Memo is said to be resource-efficient and offer high peak load capacity, with more than 1000 concurrent users. It has a Disoss interface and can connect to DEC's All-in-One, Wang Office, telex, CICS, TSO, IMS and other environments. Snads and X.400 gateway features are being added. A PC interface lets IBM-compatible micros connect to the system. Verimation also offers Dialout, an information retrieval tool that lets 3270 terminal users link to remote hosts via X.25 lines, and Sesam, a session management system said to offer "single systems image" access to a number of applications.

Software Distribution International Pty Ltd: (02) 957 4928.

Tymlabs lets Mac emulate HP screen

MELBOURNE — Macintosh users can hook up their machines to Hewlett-Packard HP3000 minis as terminals with the Mac2624 emulation package from Tymlabs. The $A355 program, distributed locally by systems house Megatec, is said to emulate a topend HP block mode terminal, with all modes, parameters, keyboard features and display characteristics. The mouse can be used for cursor-positioning or function selection. The program also provides modem control, supports data rates of 300-57,600k-bits/sec and has configurable terminal identification.

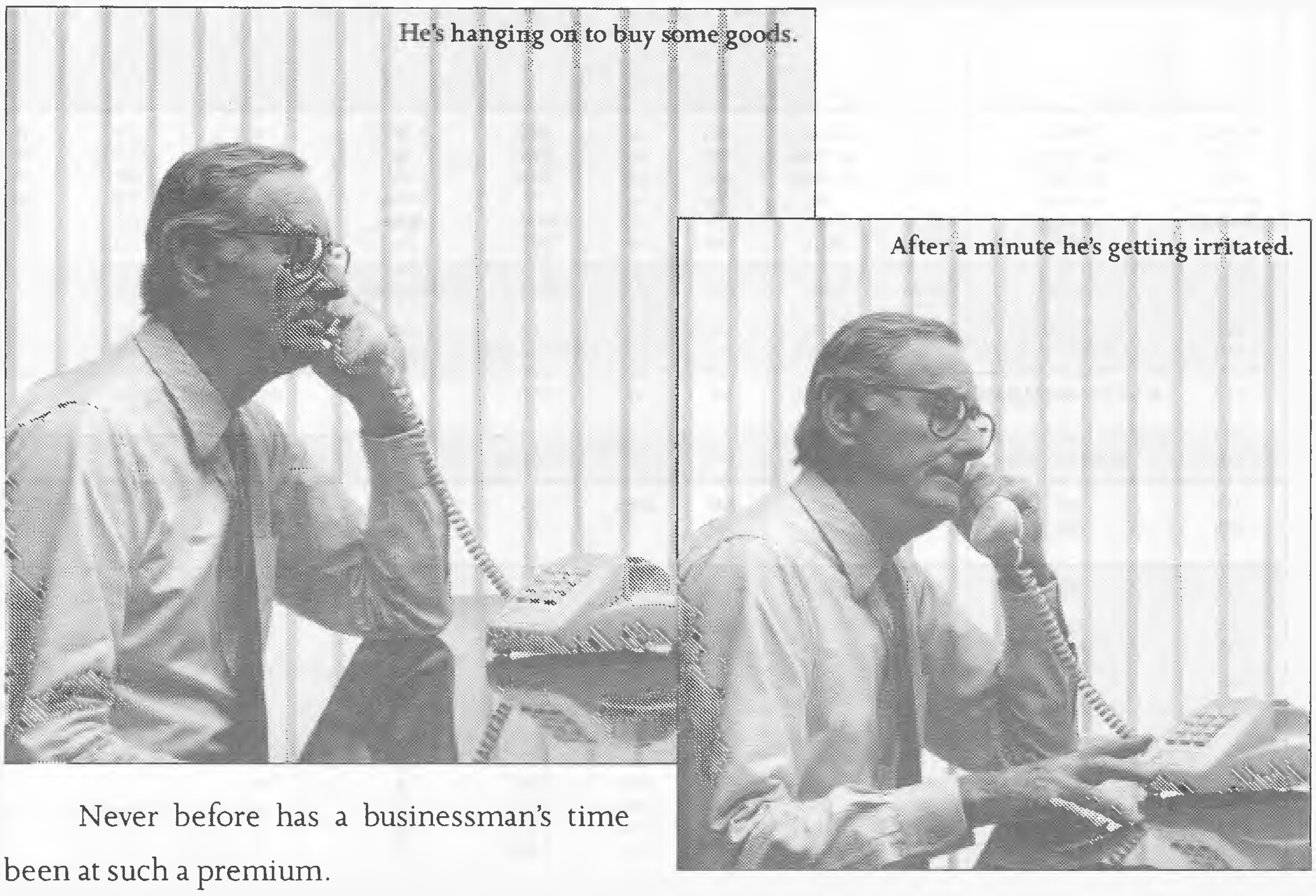
Megatec Pty Ltd: (03) 874 3633.

NEC TMS for multiple PABX

MELBOURNE — NEC has released what it claims is the world's first commercial telephone management system capable of handling multiple PABXs. Developed in Australia, the TMS system runs on the company's Astra mini. David Guy, who headed the development team, said with earlier systems it was impossible to tell in a multi-PABX network whether calls transferred within the system were internal or external calls. This prevented network managers from providing for correct charging to departments. TMS reportedly can distinguish between external and internal calls, whether made from within the network or from outside. The system provides graphics and on-demand reports on the network status that can pinpoint large potential savings, according to the company.

NEC Australia Pty Ltd: (03) 267 5599.

C&C Computers and Communications



He's hanging on to buy some goods.

After a minute he's getting irritated.

Never before has a businessman's time been at such a premium.

What's more, it's getting more valuable by the day.

To the extent that businessmen worth their salt will no longer waste time with inefficient business practices.

Not in their own company. And certainly not in someone else's.

Yet, if your existing telephone system is straining at the seams, you are forcing both potential and existing customers to hang on.

Inevitably to hang up.

As often as not taking their business with them.

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A more efficient business.

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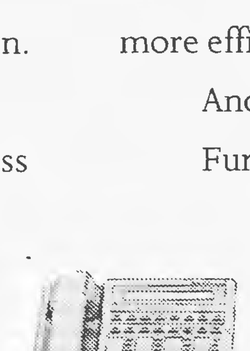

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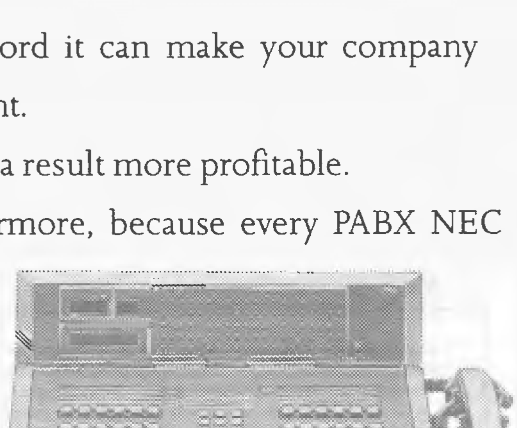

PABX Console

Another Apple turnover . . .

FRAMINGHAM, Mass - Alloy Computer Products has announced Link-Mac, a product designed to connect the Apple Macintosh to Alloy's PC-Plus network. With Link-Mac installed, the Macintosh acts as a terminal on an MS-Dos Alloy network, and can fully access all IBM PC functions including 3278 emulation. Link-Mac is integrated into the Mac's icon-oriented menu providing compatibility with the Mac's standard menu operation. File transfer capabilities between the Macintosh and the PC-Plus shared disk drives are supported in both directions. The Link-Mac software will sell for $US195 and is expected to be available in the US this month. An additional RS-422 connection adapter is required.

Alloy Computers Products: (03) 561 4988.

Multimate nets file servers

SYDNEY — Imagineering is shipping Multimate Advantage II Lan, said to add file and document locking, document sharing and individual modification of system defaults. The software runs on PC-Net and Token Ring, 3Com+, Advanced Netware 86 and others using PC-Dos 3.1-compatible operating systems. The program permits simultaneous use of libraries, dictionaries and key procedures and offers printing enhancements such as removing spooled items from a Novell print queue.

Imagineering: (02) 697 8666.

E-mail interface ties in WU nets

NAPLES, Florida — Fischer International Systems Corp has announced support for the full range of Western Union communication services from mainframes and personal computers with a new interface for its Emc2 electronic mail program. The company says its new offering reflects its commitment to provide a global electronic mail enviroment for Emc2 users. Bridges are already available for Disoss, Profs and Bitnet users. A PC support feature lets users tie PCs to mainframes for binary and text file transfers.

Fischer International Systems Corp: (0011-1) 813 643 1500.

dBase III support for new Microvax

SYDNEY — Ashton-Tate says its dBase III Plus local area network version will operate with DEC's new Microvax 3500 and 3600 as servers in a networked enviroment. A-T managing director Keith van Klink said the company expected these machines to be "major players in the PC network server arena", and dBase III compatibility with the minis via DEC's VMS services for MS-Dos was a major breakthrough for Ashton-Tate. The dBase III Plus Lan Pack provides up to five additional users with access to the relational database residing on the network server.

Ashton-Tate Pty Ltd: (02) 868 3600.

Unix V/386 goes International . . .

TOKYO — AT&T Unix Pacific has released International Unix V/386, described as a standard computing platform that provides the basis for support of any language, "ending complete dependency on the Ascii code set". The operating system includes the latest AT&T communications features, including remote file sharing, Streams TTY drivers and Extended Unix System Codes (EUC) that are designed to support the ISO standard code sets. The product will be supported from Tokyo by AT&T Unix Pacific.

AT&T Unix Pacific Co Ltd: (0011-81-3) 431 3305.

Mainframe link with security

SYDNEY — Pansophic Systems has introduced a micro/mainframe link said to permit file sharing among all networked PC users. The Corporate Tie reportedly lets users engage in distributed corporate processing while retaining the ability to develop or run modified applications on their machines. The program includes builtin security and administration and management features. A host communications interface provides terminal emulation. The mainframe site can contact remote PCs at any time in unattended control mode.

Pansophic Systems Australasia Pty Ltd: (02) 929 4677.

Vax software catalogue out

SYDNEY — Digital Equipment Corporation will publish the 4th edition of its Vax Software Referral Catalogue for Australia and New Zealand in December. The catalogue is claimed to be the only comprehensive listing of software available for DEC's Vax computers. The current (third) edition has been distributed to more than 2000 customers and prospects worldwide. DEC will also give software developers a listing in its Softbase online database, accessible by DEC staff worldwide, which is considered a key export referral opportunity.

Digital Equipment Corp (Australia) Pty Ltd: (02) 412 5252.

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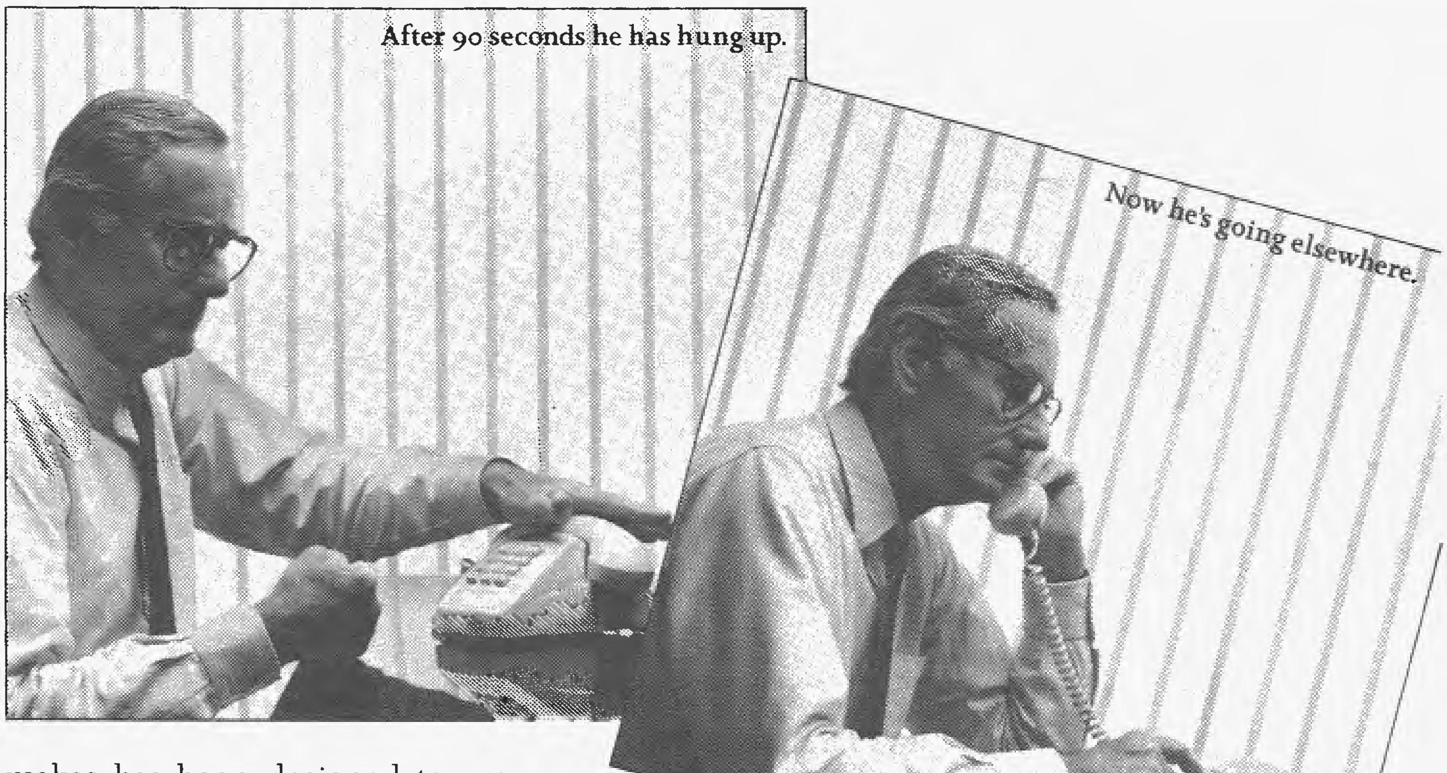

After 90 seconds he has hung up.
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